HP Server
Remote Management Card

User Guide
for
tc3100 and tc4100 Servers



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1 Quick Start

This chapter provides a quick overview of the steps required for setting up and using the HP Server Remote Management Card. If you have experience setting up computer hardware and software, you can use the following section as a brief installation guide. Before installing the HP Server Remote Management Card, you must already have completed initial installation and configuration of your HP Server. For a brief overview of how the HP Server Remote Management Card works, see Figure 2-1 before proceeding.

Before you begin, review the "HP Server Remote Management Card System Requirements" section of Chapter 2.

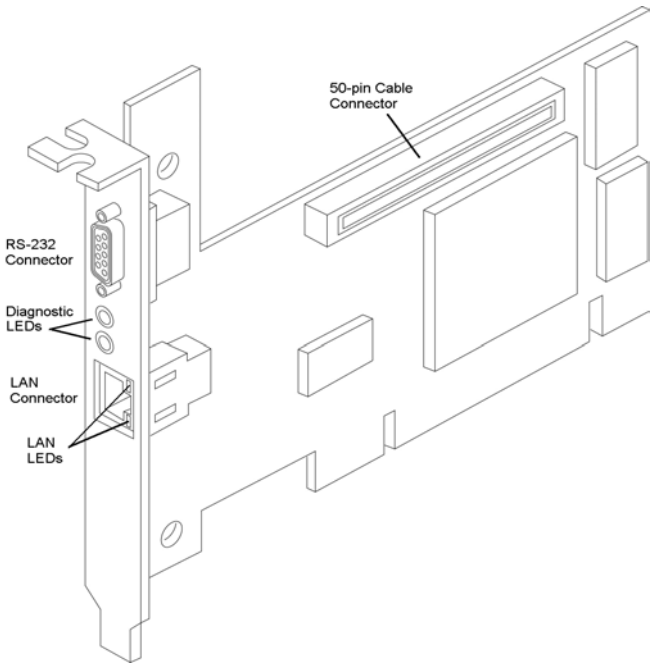


Figure 1-1. The HP Server Remote Management Card PCI Card Connectors

Install and connect the Remote Management Card (see Chapter 3 for detailed instructions):

1. Connect one end of the supplied 50-pin ribbon cable to the connector on the HP Server Remote Management Card.

2. Install the HP Server Remote Management Card in PCI slot 6.
3. Connect the free end of the 50-pin ribbon cable to the 50-pin connector on the server's system board. The connector is keyed.

IMPORTANT	After you have installed the HP Server Remote Management Card, you must flash the server system BIOS. Flashing the BIOS populates the sensor data repository on the Remote Management Card. This is required to make environmental data available to the Management Card's web interface.

Install and connect the Diagnostic Card that was shipped with your HP Server Remote Management Card (see Appendix I for detailed instructions):

Set up the remote connection (see Chapter 4 for detailed instructions):

1. Set up the LAN or modem connection that allows the HP Server Remote Management Card to communicate with a remote client:
 - ◊ **For a LAN connection**: Connect your dedicated 10/100Base-T compatible LAN line to the card's RJ-45 LAN connector.
 - ◊ **For a modem connection:** Connect a serial modem cable (not provided) to the card's serial port and connect the other end to an external modem.
2. Boot the server. During Power-On Self-Test, when prompted, press F3 to enter the HP Server Remote Management Card BIOS setup program.
 - ◊ **If you plan on connecting to the HP Server Remote Management Card via the LAN:** Define card's TCP/IP properties (either use a unique IP Address for the card, subnet mask, and gateway, or enable DHCP and have your DHCP server assign these addresses for you).
 - ◊ **If you plan on connecting to the HP Server Remote Management Card via modem:** Define the card's PPP settings (modem initialization string, IP address, subnet mask). Typically, you would leave the PPP IP address and PPP subnet mask at the factory defaults since your PPP connection does not interact with the site network.
3. Save the configuration and exit.
4. At a remote client running Microsoft Windows NT 4.0 or Windows 95, 98, ME or 2000:

If you plan to connect to the HP Server Remote Management Card via the LAN:

- Verify that the client has TCP/IP software is installed and it is properly configured for your LAN (client's IP address, subnet mask, and gateway) by checking the TCP/IP protocol properties from the Network program in the control panel.
- Verify your client's browser's proxy settings. If your site uses a proxy server, enter the IP address of the HP Server Remote Management Card in the browser's exceptions list to bypass it. If you are using DHCP, reboot the server and run the HP Server Remote Management Card BIOS setup program to see the assigned IP address.

And/or:

If you plan to connect to the HP Server Remote Management Card via modem (PPP):

Verify your client's PPP settings. Double-click the "My Computer" icon on your desktop and then double-click Dial-up Networking. Add an entry and define its properties (modem, initialization string, server PPP and TCP/IP setup, login script). If you wish to use server dialback, you may configure it via the HP Server Remote Management Card web interface after you first login.

5. Make your first remote connection using the HP Server Remote Management Card's web interface (see next section).

Make your first remote connection (see Chapter 5 for detailed instructions):

From the remote client, connect to the HP Server Remote Management Card via LAN or modem connection.

1. If you are using a modem (PPP) at the remote client (proceed to step 2 if you are not), make your connection using the Dial-Up Networking program. Once your connection has been established, proceed to step 2.
2. At the remote client, start your web browser software.
3. Enter the URL address of the HP Server Remote Management Card, which should be *one* of the following:
 - If connecting via LAN, enter either the card's IP address (for example: http://xxx.xxx.xxx.xxx/), or a host name, if one has been assigned to the HP Server Remote Management Card in your DNS server (for example: http://*cardname.companyname*.com).

- ◊ If connecting via modem, enter the card's PPP IP address that you entered when you ran the HP Server Remote Management Card BIOS setup (for example: http://xxx.xxx.xxx.xxx/).

Once you are connected, the HP Server Remote Management Card Identity page is displayed in your browser window (see Figure 5-1).

4. Click the Configuration Tab. The login prompt is displayed.
5. In the User Name field, enter a valid administrator name. For your first login, the factory default name is ADMIN.
6. At the password prompt, enter the password that belongs to the administrator name. For your first login, the factory default password is ADMIN.

NOTE The user ID and the access password for the HP Server Remote Management Card software are case sensitive. To avoid a potential security breach allowing someone to log in using the defaults, your first task should be to set up an administrator for the card. Under Configuration|User, create a new user assigned to the "Administrator" group and assign a new password. Then delete the default ADMIN user account.

7. Once logged into the HP Server Remote Management Card web interface, create your user groups and set your communication and notification preferences. If you have HP Toptools Device Manager, you can perform some administration actions on multiple cards at once. See online help for details (click the "?" button in the upper right corner of the browser window).

You are now logged on to the HP Server Remote Management Card. For a description of features, see the section, "HP Server Remote Management Card Features and Functions," in Chapter 2.

2 Introducing the HP Server Remote Management Card

The HP Server Remote Management Card combines an intelligent PCI card and integrated software that provides powerful remote server management. Management capabilities include server status monitoring, configurable event notification, and diagnostic features. The card's remote management capabilities are accessed using standard web browser software. The HP Server Remote Management Card consists of:

- **HP Server Remote Management Card.** A PCI card that plugs into your HP Server. It includes an independent processor and draws power from the server's PCI bus.
- **A comprehensive management application stored in the board's firmware.** Using this software, the HP Server Remote Management Card provides remote server control and management. Access to Intelligent Platform Management Bus (IPMB), located on the server, provides for monitoring, server power control and diagnostic features.

NOTE To provide complete independence from the server's Network Operating System, the HP Server Remote Management Card is accessed and controlled via a separate and independent communication interface (LAN or RS-232) built onto the product's PCI card.

- **A platform-independent web-based graphical user interface.** The HP Server Remote Management Card web interface allows users to connect to the card in the server and, using a standard web browser, run the stored management application. Access to card functions may be controlled by specifying user access privileges.

 Note that using a "web" interface does not mean that the card may be accessed by anyone on the Internet. Your company's firewall and proxy servers prevent outside access to your local network or intranet. The dialback capability also provides extra security when communicating with the card via a dial-up modem.

How the HP Server Remote Management Card Works

The HP Server Remote Management Card operates independent of the server. It has its own processor chip, a serial and LAN port, and interface. These are completely separate from the server and the server's Network Operating System (NOS). The benefit to network administrators is comprehensive remote server management, even in the event of a downed server. Thus, the HP Server Remote Management Card frees system administrative staff from direct round-the-clock server monitoring.

When the HP Server Remote Management Card detects a problem, it immediately notifies the assigned administrator by sending a notification message that identifies the server and the nature of the problem using one or more of the following methods:

- E-mail (server ID and short text message identifying the problem)
- Numeric page (server ID and five-digit event code)
- Alphanumeric page (server ID and short text message identifying the problem)

Regardless of location, an administrator can log in to the server using a standard web browser and run the HP Server Remote Management Card software to identify and, in many cases, correct server problems. See Figure 2-1.

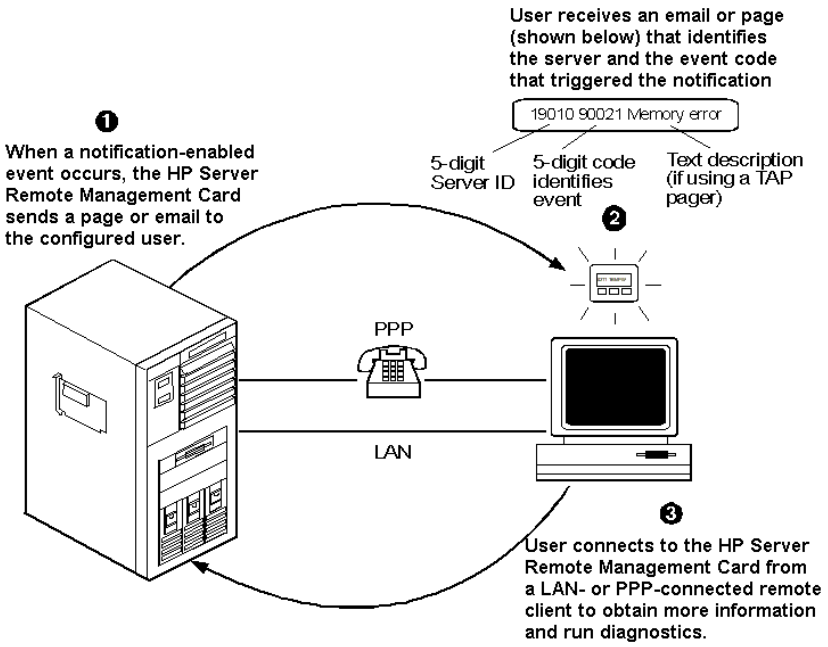


Figure 2-1. The HP Server Remote Management Card Management Process

Package Contents

Your HP Server Remote Management Card product contains the following:

- An HP Server Remote Management Card
- An *HP Netserver Navigator CD*
- A 50-pin ribbon cable kit
- A visual diagnostic panel kit
- A visual diagnostic panel cable kit (tc3100 only)

Documentation

The HP Server Remote Management Card includes the following documentation:

- This guide, which describes how to install the HP Server Remote Management Card and set it up to communicate with the server.

- The HP Server Remote Management Card web interface online help, which describes all aspects of the user interface including how to use the HP Server Remote Management Card to manage your network server.
- pcAnywhere online documentation. The complete *pcAnywhere User Guide* is in Adobe Acrobat PDF format on the *HP Netserver Navigator CD* in the \util\pca32*xx*\ subdirecory (where *xx* represents a two letter abbreviation for your local language).
- The HP Server Remote Management Card README file located in the \ttrc2\us directory of the *HP Netserver Navigator CD*, provides up-to-date information that became available after this guide was printed.

NOTICE	This and all other manuals describing the use of your HP Server, its features, and its accessories may be found in your *HP Server Documentation CD-ROM*, *Accessory Documentation CD-ROM*, and on our web site: http://www.hp.com (available under "technical support") Refer to the web site for the latest revisions and product updates.

Acronyms

The following acronyms designate hardware and software components that are associated with the HP Server Remote Management Card installation or usage. You will encounter these acronyms throughout this user guide.

- **DHCP:** The Dynamic Host Configuration Protocol provides a mechanism through which computers using TCP/IP can obtain protocol configuration parameters automatically through the network.
- **IPMB:** Intelligent Platform Management Bus. Name for the architecture, protocol, and implementation of the industry-standard Intelligent Platform Management Interface (IPMI) server management bus that interconnects the server's system board and chassis instrumentation electronics. The HP Server Remote Management Card connects to the IPMB via the 50-pin ribbon cable, thus providing access to the server's event log, system sensors and the server's front panel and reset controls.
- **PPP:** Point-to-Point Protocol. A standardized network protocol for dial-up network connectivity.

- **TFTP:** Trivial File Transfer Protocol. This file transfer protocol allows PUT and GET operations with absolute file names and does not require user authentication. The HP Server Remote Management Card uses TFTP to implement firmware updates and remote boots.

Who Should Use This Guide

This guide is designed for system administrators and people who are familiar with installing, managing, and troubleshooting servers on a network. It assumes that you are knowledgeable about using operating systems such as Microsoft Windows 95, 98 or 2000 and Windows NT, using web browsers such as Microsoft Internet Explorer and Netscape Communicator, and installing software and hardware in PC systems.

HP Server Remote Management Card Features and Functions

The HP Server Remote Management Card provides a wealth of server management features that make it a powerful remote management tool. The HP Server Remote Management Card works independently of the server's state and network operating system. An on-board, web-based user interface is accessed via communications ports (for modem or LAN) that are functionally independent from the HP Server on which the HP Server Remote Management Card is installed.

For security reasons, access privileges are mapped to user groups. In the following chapters, all features and functions are described from an administrator's point of view. However, subsets of the HP Server Remote Management Card features and functions are also available for use by operators and users.

Remote Management

Remote server console redirection. An administrator at a remote client (connected to the server via a modem and or LAN) can view the server console screen and take control of the keyboard, performing operations as if seated at the server. The HP Server Remote Management Card supports character-based server console screens. Windows graphics console redirection is supported using Symantec's pcAnywhere software (included on the *HP Netserver Navigator CD*).

Remote access to server power functions. An administrator at a remote client has virtual control of the server's power states. He or she can reset the server with a graceful shutdown (if the Server SNMP agent software is installed), a reboot, or a complete power cycle. An administrator can also remotely power off the server

if, for example, there has been a critical hardware failure. If text remote control is enabled during server reboot, the actual bootup screens can be viewed at a remote site.

Remote configuration. An administrator at a remote client can reconfigure the HP Server Remote Management Card and change features such as notification actions. An administrator can also change user and administrator permissions without having to be at the server.

Management and Security

Remote management security. An administrator can assign access for up to 16 users, providing them with individual login identification, encrypted password, and privileges. User privileges define the right to perform a specific action (for example, powering down the server). Use management can thus be set up by an administrator at a remote site without compromising network security. The HP Server Remote Management Card login procedure is protected so that the password is not sent across the LAN.

Dialback option. If a user is using modem communications, the HP Server Remote Management Card may be configured for dialback. Dialback authorization requires the user's ID. If the ID matches an entry in the user database, the HP Server Remote Management Card initiates an automatic call-back via the external modem connected to the card.

Server Performance Monitoring

The HP Server Remote Management Card monitors I/O performance by gathering statistics on PCI bus usage. The following server operations and conditions are monitored:

- **Bus utilization.** The ratio of use to total PCI cycles. This is an indicator of the server's I/O load.
- **Bus efficiency.** The ratio of the amount of data transferred (throughput) to total PCI data transfer capacity. This is an indicator of how effectively the server's PCI devices are using the bus.

The HP Server Remote Management Card monitors the following conditions:

Environment monitoring. The HP Server Remote Management Card displays sensor values for each sensor in the server. These include sensors for voltages, temperatures, and fan speed.

Logging of server events. The HP Server Remote Management Card displays the server's System Event Log (SEL) information for viewing by an administrator at a remote client. This is the same event log available via Toptools when the server is online.

Event notification. The HP Server Remote Management Card notifies designated users when an event occurs that has been specified for notification. Using Remote Control notification, an administrator's valuable time is freed from constant surveillance of the server, and server downtime is kept to a minimum. The HP Server Remote Management Card can send notification via email using the Simple Mail Transfer Protocol (SMTP), numeric pager, or alphanumeric pager using the Telocator Alphanumeric Protocol (TAP). An administrator can define the notification path and enable or disable paging for any event group.

TAP paging allows the HP Server Remote Management Card to send meaningful text notifications to designated pagers. If your mobile phone service provider supports the TAP protocol, you can use the HP Server Remote Management Card to send Short Message Service (SMS) notifications up to 160 characters in length to your mobile phone.

Diagnostics

Memory diagnostics. If enabled, this function reads continuously through the complete memory range at a defined maximum performance impact. Single bit errors are logged and a session count is calculated.

Last screen before Automatic Server Restart (ASR). If the Server SNMP agents software is installed, the HP Server Remote Management Card automatically captures a snapshot of the server's screen (blue screen on Windows NT servers) upon an ASR event, preserving error messages or other screen activity that appeared before restart. An administrator can view the snapshot from a remote client and use the screen contents to troubleshoot server problems.

Other Features

Automatic server shutdown on voltage or temperature emergencies. The HP Server Remote Management Card can be configured to automatically shut down your server if it detects an over-voltage or over-heating condition.

Remote floppy boot of the server. For remote reboot, the HP Server Remote Management Card allows an administrator to specify a boot floppy image file located on a TFTP server (see Appendix C for details). The HP Server in which the HP Server Remote Management Card is installed automatically fetches this boot image after a reset operation and executes the new boot image. Using this feature, for example, an administrator can remotely update the HP Server's BIOS, or remotely run server diagnostics.

Remotely upgrade firmware. The HP Server Remote Management Card management program code is stored in Flash ROM on the HP Server Remote Management Card. If it is necessary to upgrade the firmware, a newer revision of the program code may be downloaded via a TFTP server to the programmable

ROM (see Appendix C for details). When available, new firmware versions can be obtained from the HP web site.

SNMP support. The HP Server Remote Management Card includes SNMP support embedded in firmware on the Remote Control card. SNMP queries (MIB-II) provide seamless integration with any SNMP management platform including HP Toptools and HP OpenView. SNMP traps that occur during a server hang or power down may be forwarded to a management console of your choosing. These management solutions provide in-band (network connected) monitoring of your servers.

DHCP support. DHCP is based on a client-server paradigm in which the HP Server Remote Management Card contacts a DHCP server for configuration parameters. The DHCP server is typically centrally located and operated by the network administrator. The HP Server Remote Management Card can be reliably and dynamically configured with parameters appropriate to the current network architecture. These parameters are the IP address, subnet mask and default gateway.

Integration with HP Toptools Device Manager. The HP Server Remote Management Card fully integrates with the Toptools Device Manager product (version 5.0 and above). Access to your HP Server Remote Management Card may be done via accessing a server page of a server that has the HP Server Remote Management Card installed, or through the **Others** list under **Devices|Device Types**.

Group actions: If you use the HP Server Remote Management Card in a server managed by HP Toptools Device Manager, you can perform "group actions" on multiple HP Server Remote Management Cards by selecting all the cards you want with your mouse and right-clicking. Group actions include adding and deleting users, changing user passwords, viewing user configurations, replicating card configurations, powering on and off the server, and updating card firmware.

CAUTION	A special procedure is required when performing group actions on tc3100 and tc4100 servers. This is presented in Appendix G.

HP Server Remote Management Card System Requirements

Minimum Server Requirements

To install and use the HP Server Remote Management Card, you will need:

- A tc3100 or tc4100 HP Server with PCI slot 6 available.
- The server must also have been initially set up with a Network Operating System and the HP Server SNMP agents installed. The HP Server Remote Management Card uses these agents to perform certain functions. If you are not sure, refer to the HP Server SNMP agent installation instructions available from the Information Assistant program on the *HP Server Documentation CD-ROM* that came with your server.
- An external modem (required only for paging and dial-up remote access). A list of tested modems is included in Appendix B.
- A dedicated 10/100Base-T compatible LAN connection (required for email notification and LAN access) and a unique IP address for the HP Server Remote Management Card (either fixed or DHCP).
- For HP Servers running Windows NT 4.0 or Windows 2000, full graphics console redirection to the remote client is available using Symantec's pcAnywhere (see Chapter 6, Setting Up Windows Graphics Console Redirection Using pcAnywhere).

Minimum Remote Client Requirements

To access the HP Server Remote Management Card, you need the following:

- A personal computer with an Intel Pentium processor
- A VGA color display (800 X 600, *greater* than 256 colors minimum resolution)
- Microsoft Windows 95 (with Service Pack 1), 98, 2000, ME or Windows NT 4.0 (with service pack 3)

LAN Connection Requirements

To access the HP Server Remote Management Card via LAN, you need the following:

- LAN connection with 10/100Base-T support
- Supported web browser (see below)

Dial-up (PPP) Connection Requirements

To access the HP Server Remote Management Card via modem, you need:

- A supported modem (refer to Appendix B) and phone line

- MS Windows NT or Windows 95, 98 ME or 2000 Dial-up Networking installed. For non-Windows platforms, suitable PPP software installed.
- A supported web browser (see below)
- pcAnywhere Version 8.0 or above for Windows NT 4.0 and pcAnywhere 9.2 for Windows 2000 server console redirection and serial driver software (included on *HP Netserver Navigator CD*)
- TCP/IP stack (included with Microsoft Windows software)

Supported Web Browsers

To access the HP Server Remote Management Card's web-based user interface, a web browser must be installed at the remote client. Minimum browser requirements are:

- Internet Explorer 4.01 with Service Pack 1 (version 4.72.3110.8, update version SP1, as viewed from the "About Internet Explorer" option under Help) or higher (downloadable from Microsoft's web site: http://www.microsoft.com)
- Netscape Communicator 4.5 (as viewed from the "About Communicator" option under Help) or higher (downloadable from Netscape's web site: http://www.netscape.com)

NOTE	Netscape 4.5 does not allow for independently resizing Java applets inside HTML frames.

3 Hardware Installation and Configuration

This chapter provides instructions for installing the HP Server Remote Management Card in a server and setting up a hardware connection that permits remote management of the server. (See Chapter 4 for information on setting up the HP Server Remote Management Card management software.) Installation and configuration of the hardware includes:

- Preparing the HP Server Remote Management Card
- Installing the HP Server Remote Management Card
- Running the HP Server Remote Management Card BIOS setup program
- Verifying that the HP Server Remote Management Card has been installed correctly

Preparing the HP Server Remote Management Card

CAUTION	The HP Server Remote Management Card is sensitive to static electricity and can easily be damaged by improper handling. Use of an antistatic service kit, such as 3M® 8501/8502/8505 or equivalent is recommended.

Connecting the 50-pin Ribbon Cable to the Remote Management Card

The HP Server Remote Management Card provides an interface to the server system board that allows remote monitoring of all sensors (for example, voltages and temperatures) built into the system board, as well as access to the System Event Log (SEL), and control of the front panel power and reset buttons.

Before installing the HP Server Remote Management Card in the server, you need to connect the 50-pin ribbon cable to the card.

1. Locate the 50-pin connector on the HP Server Remote Management Card.

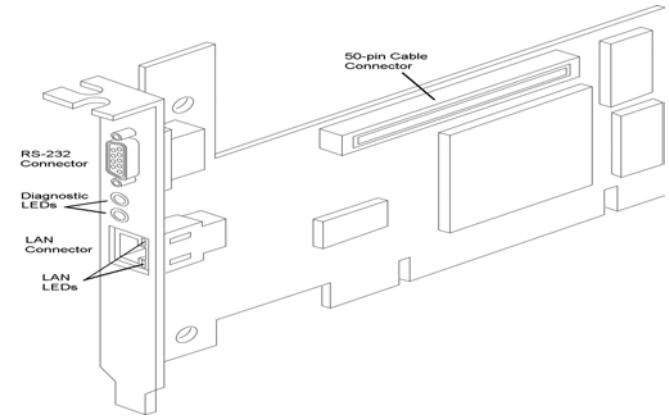


Figure 3-1: Locating the 50-pin Connector

2. Plug the end of the 50-pin ribbon that is labeled “To Card” into the card’s connector.
3. If additional cable is needed, order HP Part Number P3537-63010.

NOTE	The ribbon cable is keyed to prevent incorrect cable connection.

Installing the HP Server Remote Management Card in the Server

Install the HP Server Remote Management Card into slot 6 on your server’s system board. For specific information about installing a PCI card in your server, refer to the *Operations and Maintenance Guide* supplied with your server. See Appendix D, "Technical Specifications," for information about the power requirements for the HP Server Remote Management Card.

WARNINGS	**1.** Power down your Server and unplug all connecting cables before installing your Management Card. *Always* disconnect AC power and unplug external connecting cables from HP Servers before working inside the unit. Hazardous voltages are present inside the Server that may persist until the power cords are unplugged, even after the

Server is powered down. Serious injury may result if this warning is not observed.

2. You must plug the Remote Management Card into slot 6.

Connecting the 50-pin Ribbon Cable to the Server

After you have physically installed the HP Server Remote Management Card into slot 6 of your server, you must cable the card to the server's system board. One end of the supplied ribbon cable should already be connected to the Remote Control Card (see previous section). Connect the other end to the system board's 50-pin connector that is immediately adjacent to the inserted card.

NOTE The ribbon cable is keyed to prevent incorrect cable connection.

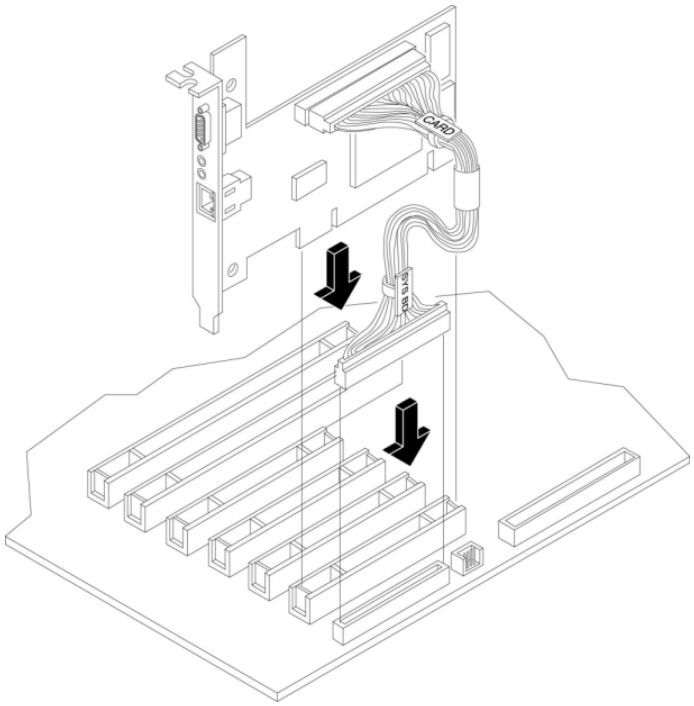


Figure 3-2: Installing the Remote Management Card

IMPORTANT	After you have installed the HP Server Remote Management Card, you should install the Visual Diagnostic Panel that was shipped with the Remote Management Card. Refer to Appendix I for instructions.

Flashing the Server's System BIOS

After you have installed the HP Server Remote Management Card, you must flash the server system BIOS. Flashing the BIOS populates the sensor data repository on the Remote Management Card. This is required to make environmental data available to the Management Card's web interface.

1. Insert the *HP Netserver Navigator CD* supplied with the HP Server Remote Management Card in the Server's CD-ROM drive and reboot.
2. Flash (i.e., update) the system BIOS.
3. When you have finished, remove the *HP Netserver Navigator CD* and reboot the system.

Verifying Card Installation

Each time the HP Server Remote Management Card is powered up, a built-in self-test procedure automatically executes.

Self Test Power Up Sequence

During the HP Server Remote Management Card's self test, observe the diagnostic LED located just below the card's RS-232 port (refer to Figure 3-3).

1. The green (heartbeat) LED (located immediately above the LAN connector) and the green LAN LED (*on* the LAN connector) switch on for about 10 seconds.
2. If no errors are detected, the green heartbeat LED flashes twice every second, indicating normal operation. After initial power-up, the red LED should not be visible.
3. If, after power up, the red error LED switches on, a problem with the HP Remote Control card is indicated. Refer to Appendix E for detailed information about blinking LED failure codes.

Before you can use the HP Server Remote Management Card, an independent communications link (LAN or modem) must be set up, cabled, and properly

configured. Proceed to the next chapter for detailed instructions on how to set up a remote connection to the HP Server Remote Management Card.

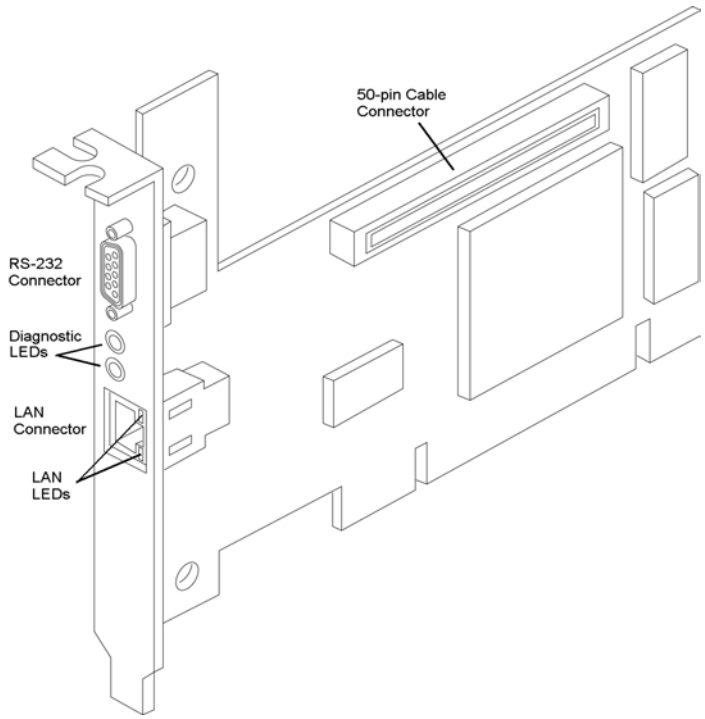


Figure 3-3: The HP Server Remote Management Card PCI Card LEDs

4 Setting Up the Remote Connection

This chapter describes how to cable and configure the remote communications link to the HP Server Remote Management Card (LAN or modem). Once communications have been established, you may control your HP Server using the HP Server Remote Management Card web interface.

NOTE	If you have not provided for an independent communications link to the card (either via a dedicated LAN line or dial-up modem line), you will be unable to communicate with the HP Server Remote Management Card.

Your options for setting up the server for remote connection include one, or both of the following:

- A connection through the local area network (LAN) via a dedicated line connected to the HP Server Remote Management Card's LAN port
- A connection through an external modem connected to the HP Server Remote Management Card's RS-232 (serial) port

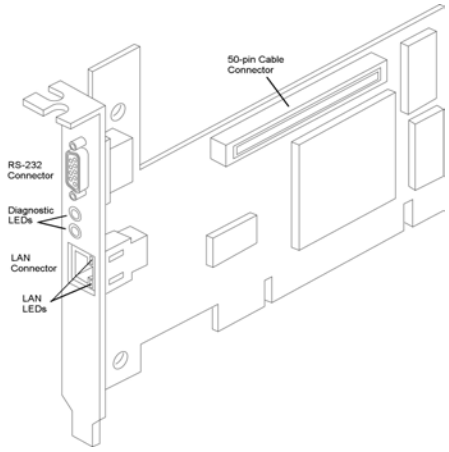


Figure 4-1. Remote Connection Options

Regardless of the type of physical connection joining the HP Server Remote Management Card and remote client, you must initially use the HP Server Remote Management Card BIOS setup program at the server (described in the next

section) to configure a communications link between the HP Server Remote Management Card and a remote client.

Running the HP Server Remote Management Card BIOS Setup Program

The HP Server Remote Management Card includes its own on-board processor that provides remote access and server supervision even if the server's power and operating system are not functional. Because of the card's operational independence, the installation procedure differs from more standard PCI interface cards, such as LAN cards.

Use the card's BIOS setup program (available at server bootup) to configure the card for the connection you plan to use. For example, if the HP Server Remote Management Card is to be accessed via your local area network, the LAN settings must be defined. If you are planning both local area network and modem access, you need to define both LAN and the PPP settings.

NOTE Once the communications link is initially configured using the HP Server Remote Management Card BIOS Setup program, you can change these configuration parameters at your remote client using the HP Server Remote Management Card web interface (described in Chapter 5) without rebooting the server.

To configure the HP Server Remote Management Card:

1. Boot the server.
2. Wait for the monitor to display the message, "HP Server Remote Management Card detected, <firmware version> IP Address <xx.xxx.xxx.xxx>" then press F3 to enter the HP Server Remote Management Card setup routine.
3. Enter the appropriate number to access the required configuration screen. To exit the configuration and continue with the boot process, press X.

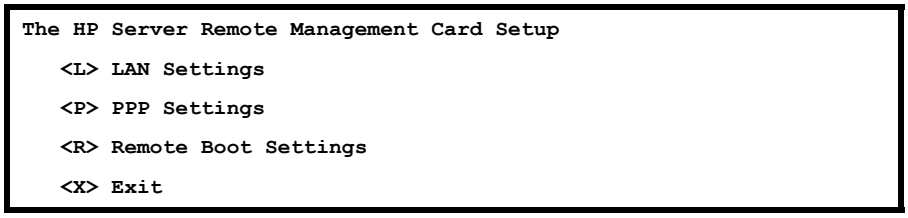


Figure 4-2. Main Setup Screen

The displayed value on any of the setting screens is updated as soon as an entered value is validated.

LAN Configuration

For a remote connection to the HP Server Remote Management Card via LAN, the LAN Settings screen is used to set up the connector on the card. If you are not sure how to set network parameters, contact your network administrator for the correct network settings.

NOTE The HP Server Remote Management Card requires its own unique IP address (different from the server's IP address), since it functions independently of the server on which it is installed.

Press the desired letter (D, I, N, or G) on the keyboard to change one of your Local Area Network settings. An entry window pops up that allows the entry of the new value. Closing this entry window initializes the validation of the new entry. If it is valid it will be updated on the corresponding setting screen, otherwise an error message occurs. Press M to return to the Main Setup Screen.

```
The HP Server Remote Management Card Setup - LAN Settings
  <D> Enable DHCP                          DHCP is DISABLED
  <I> Set IP-Address                       192.168.10.10
  <N> Set Netmask                          255.255.255.0
  <G> Set Gateway                          127.0.0.1
  <M> Main Menu
```

Figure 4-3. Local Area Network Configuration

If DHCP is *enabled*, the next time the HP Server Remote Management Card reboots it will obtain its network settings (including its IP address) from the DHCP server. The card will attempt to keep the assigned network settings for as long as possible so you will not need to go back into the card's BIOS setup program to view a new IP address (or view the card's new address via HP Toptools Device Manager) every time the card reboots. If, for some reason, the IP address on the card changes, an event will be generated warning you of the change. You may configure the card to page you for this event.

NOTE The HP Server Remote Management Card always requests the maximum lease time for network settings so that they do not change. It will also attempt to renew the lease before the lease

time expires. As long as the card does automatic renewing in time, it will not lose the leased IP Address. However, if the card is switched off, and remains off past the lease renewal date, it will lose its lease on the IP Address and will need to obtain a new one.

The Ethernet settings may be customized for your network. Normally, you would enable Auto-Negotiation. However, you may force the card's LAN port to either 10Mbits or 100Mbits, or you may force the support of full duplex which allows the LAN port to send two packets at the same time (your router or switch must support this feature).

PPP Configuration

For remote connection to the HP Server Remote Management Card via a modem, the Point-to-Point Network configuration must be enabled and defined. This includes an initialization string for your external modem, a PPP IP address, and a PPP Netmask address. Typically, you leave the PPP IP address and PPP netmask at the factory defaults since your PPP connection does not interact with the site network.

NOTE The PPP IP address must be different from the HP Server Remote Management Card's LAN IP address.

```
The HP Server Remote Management Card Setup - PPP Settings

  <P> Enable PPP                              PPP is DISABLED

  <S> Set PPP Initialization String           ATL1M1X3E0S0=3

  <I> Set PPP IP-Address                      192.168.100.10

  <N> Set PPP Netmask                         255.255.255.0

  <M> Main Menu
```

Figure 4-4. Point-to-Point Configuration

Remote Boot Configuration

The HP Server Remote Management Card is able to boot the server using a boot floppy image file located on a TFTP server (see Appendix C for detailed information about TFTP remote boot setup). This feature can also be configured at the remote client using the HP Server Remote Management Card web interface software.

To use the remote boot feature:

1. Set Remote Boot to "on." Note that once this is set, the Server will continue to attempt to boot off a remote boot image until you go back into the HP Server Remote Management Card BIOS setup program and set this option to "off."
2. Define the filename of the boot image.
3. Enter the IP Address of the TFTP server where the image file is located.
4. When you are finished running the HP Server Remote Management Card's BIOS Setup program, restart the Server and run the Server's BIOS Setup program (typically, accessed by pressing F2 when prompted during the boot-up process). Be sure that the floppy drive is listed as a bootable device and is placed first in the boot order.

```
The HP Server Remote Management Card Settings - Remote Boot Settings

  <R> Disable Remote Boot                    Remote Boot DISABLED

  <N> Set Boot Image Filename                BOOTIMG.BIN

  <A> Set IP-Address of Image TFTP Server    127.0.0.1

  <M> Main Menu
```

Figure 4-5. Preparation for Remote Boot

NOTE Instructions for setting up a TFTP server may be found in Appendix C, or contact your local network administrator for the correct TFTP server setup and for available boot images. A TFTP server should typically be located within your company's firewall.

Setting Up a LAN Connection

You can communicate with remote clients by connecting to your local 10/100Base-T compatible network using the RJ-45 jack located at the rear bracket of the HP Server Remote Management Card and an appropriate cable.

The following figure illustrates a LAN connection joining an HP Server (with the HP Server Remote Management Card) and a remote client.

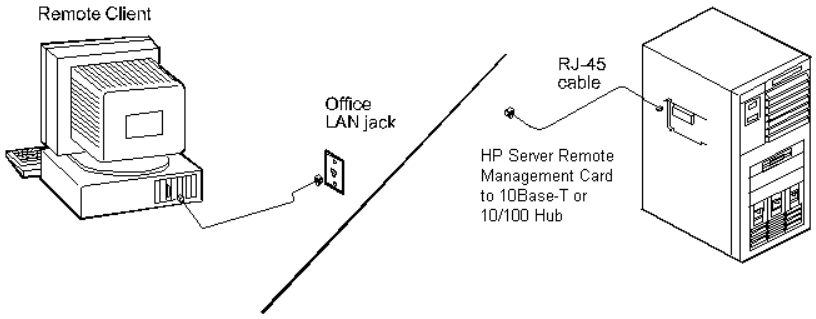


Figure 4-6. Remote Connection via the LAN

To enable remote connection over your local area network, LAN settings must have been defined in the card's BIOS setup program (see previous section).

Remote Client Configuration (LAN)

Your remote client should already be set up and connected to your local area network. Verify that TCP/IP protocol is set up properly for the client (client's IP address, subnet mask, and gateway) by checking its properties from the Network program in the control panel. Verify your browser's proxy settings. If your site uses a proxy server for Internet access, you will need to bypass the proxy server by entering the IP address of your HP Server Remote Management Card in the exceptions list.

When you are ready to make your first connection, proceed to Chapter 5.

Setting Up to Use an External Modem

You can communicate with a remote client by connecting an external modem to the card's serial communications port. A modem connection at the remote client is required to complete the data link. The following figure illustrates this type of connection joining the server and the remote client.

See Appendix B for information on modem support for the HP Server Remote Management Card.

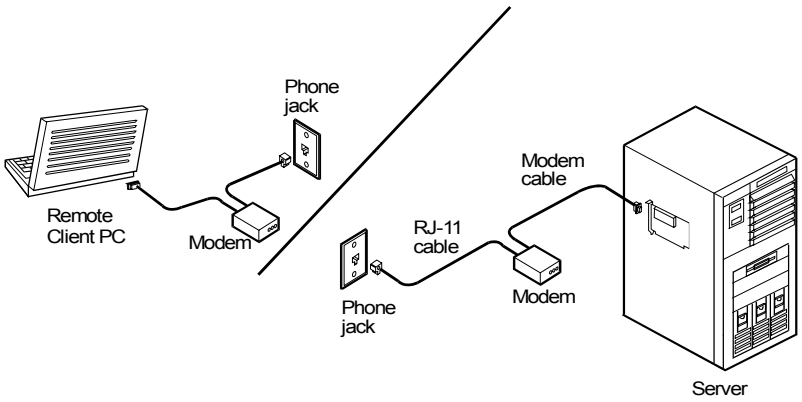


Figure 4-7. Remote Connection Through an External Modem

NOTE	HP recommends that you supply power to your external modem from an Uninterruptible Power Supply (UPS), so that you can be notified in case of an AC line power failure.

Remote Client Configuration (PPP/Dial-Up Networking)

This section describes using dial-up networking for a Windows NT 4.0 client. Windows 95, 98 and 2000 configuration steps are similar. For other operating systems, refer to your system documentation for instructions on how to set up a PPP connection.

In Windows NT 4.0, after running the HP Server Remote Management Card BIOS setup program to configure the card for PPP communication, do the following to set up the remote client for PPP communication with the HP Server Remote Management Card:

1. The Dial-Up Networking feature must be installed and a modem must be configured through the Windows Control Panel|Modems program.
2. If you want to set up dialback with your HP Server Remote Management Card:
 - ◊ From Control Panel|Modems, select your modem.
 - ◊ Click Properties.
 - ◊ Select the Connection tab.

◊ Click Advanced. Then add the following string in the "extra settings" field:

```
x3&c0&d0
```

NOTE The dialback feature cannot function properly if you do not enter this string in the Extra Settings field as indicated.

3. Configure Dial-Up Networking by double-clicking the "My Computer" icon and then "Dial-Up Networking."

NOTE If you wish to configure dialback with the HP Server Remote Management Card, you need to log in to the card first and set the dial-back number under Configuration|Users.

4. In the Dial-Up Networking window, include phonebook entry and dialing information.

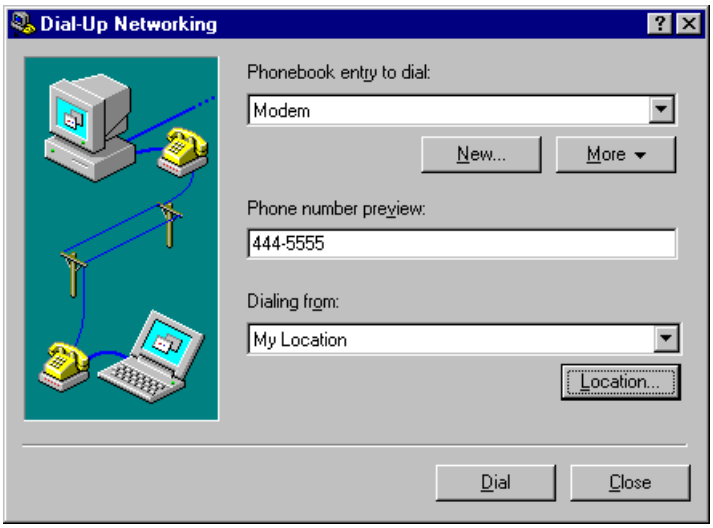


Figure 4-8. Example: Configuring Dial-Up Networking in Windows NT 4.0

5. Under "More," select "Edit entry and modem properties." Here you can set up modem configuration using the "Basic" tab.

6. Click the "Server" tab to specify the dial-up server type, network protocols, and compression. Make sure your settings match the following figure. (If you have Windows 95, make sure you do not check the "Login to network" option.)

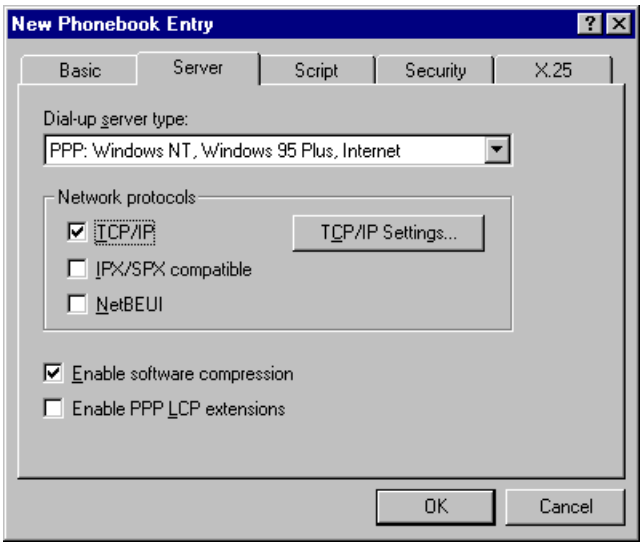


Figure 4-9. Define the Dial-Up Server Type

7. Click the "TCP/IP Settings" button (see Figure 4-10). Select the "Server assigned IP address" option. The client will automatically get an IP Address from the HP Server Remote Management Card. Check "Specify name server addresses" and make sure all DNS and WINS entry fields are set to zero (0). Uncheck "Use default gateway on remote network." Click OK.

NOTE The card derives the address using the PPP IP address of the card which it increments by "1". If the resulting address is equal to "0" or "255," it is incremented by "1" again.

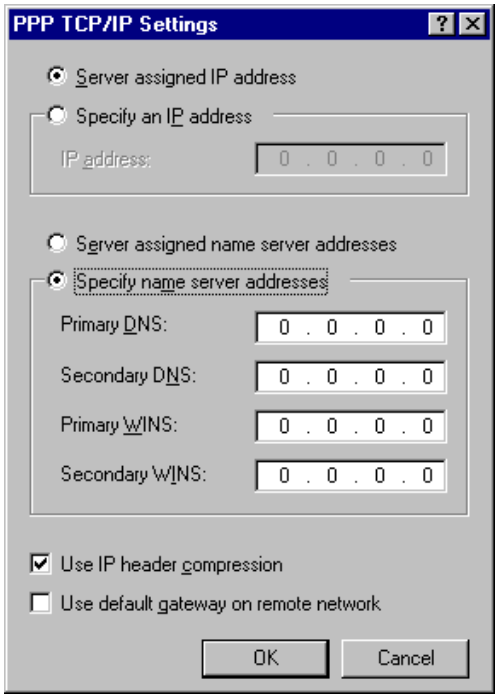


Figure 4-10. Define TCP/IP Settings

8. Click the "Script" tab. To expedite the HP Server Remote Management Card login process, use the script provided by HP included on the *HP Netserver Navigator CD* in \ttrc\us\ttrc.scp. Copy this script file to your remote client and enter that path in the script dialog box.

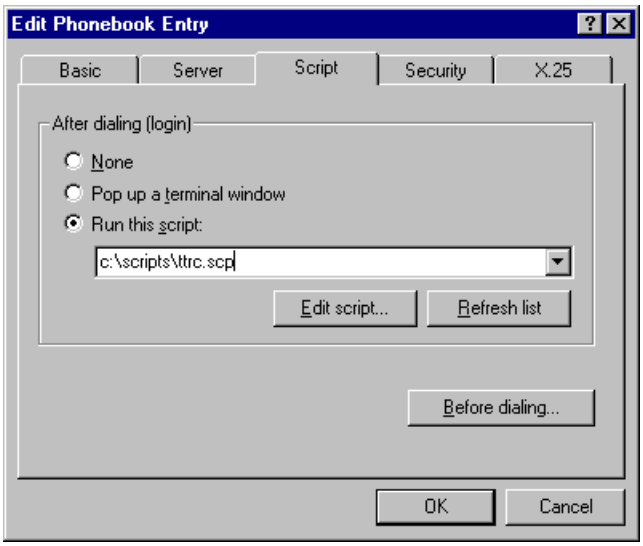


Figure 4-11. Configure Script

If you do not wish to use the script, select "Pop up a terminal window" instead.

9. Click the "Security" tab and select "accept only encrypted authentication".
10. You may now dial up to establish the modem connection to the card using the card's external modem phone number. Once connected, you will see a modem connection icon on the task bar of your desktop.



When you are ready to make your first connection, proceed to Chapter 5.

5 Using the Remote Management Card Web Interface

After you've installed, cabled, and configured the HP Server Remote Management Card using the card's BIOS setup program, you are ready to set options for the HP Server Remote Management Card using the Remote Management Card's management software.

Using your web browser you can remotely set all card options including:

- Setting up an administrator list (up to 16) for system access and notification
- Configuring event management operations, including the enabling of paging and e-mail notification
- Configuring serial communications for external modem
- Configuring LAN access

CAUTION	Configuring LAN access during a remote connection is *not* recommended. Changing your LAN access settings while logged on could terminate your connection.

- Viewing a log of server events and PCI utilization
- Viewing current measurement sensors
- Viewing server screens
- Running memory diagnostics on the server
- Performing remote firmware or BIOS updates
- Remotely power on, power off, power cycle, or reset the server

Logging In to the HP Server Remote Management Card

To initiate a connection to the HP Server Remote Management Card from the remote client, connect to the HP Server Remote Management Card via LAN or modem connection, as follows:

1. If you are using a modem (PPP) at the remote client (skip to step 2 if you are not), make your connection using the Dial-Up Networking program. Once connected, you will see a modem connection icon on the task bar of your desktop.



2. At the remote client, start your web browser software. Make sure that the proxy settings for your browser have been correctly set. If your site uses a proxy server, enter the IP address of the HP Server Remote Management Card in the browser's exceptions list to bypass it.
3. Enter the URL address of the HP Server Remote Management Card, which should be one of the following:
 - ◊ If connecting via LAN, enter the card's IP address (for example: http://xxx.xxx.xxx.xxx/), or a host name, if one has been assigned to the HP Server Remote Management Card in your DNS server (for example: http://*cardname*.*companyname*.com).
 - ◊ If connecting via PPP, enter the card's PPP IP address that you entered when you ran the HP Server Remote Management Card BIOS setup (for example: http://xxx.xxx.xxx.xxx/)

 Once you are connected, the HP Server Remote Management Card Identity page is displayed in your browser window (see Figure 5-1 for an example).

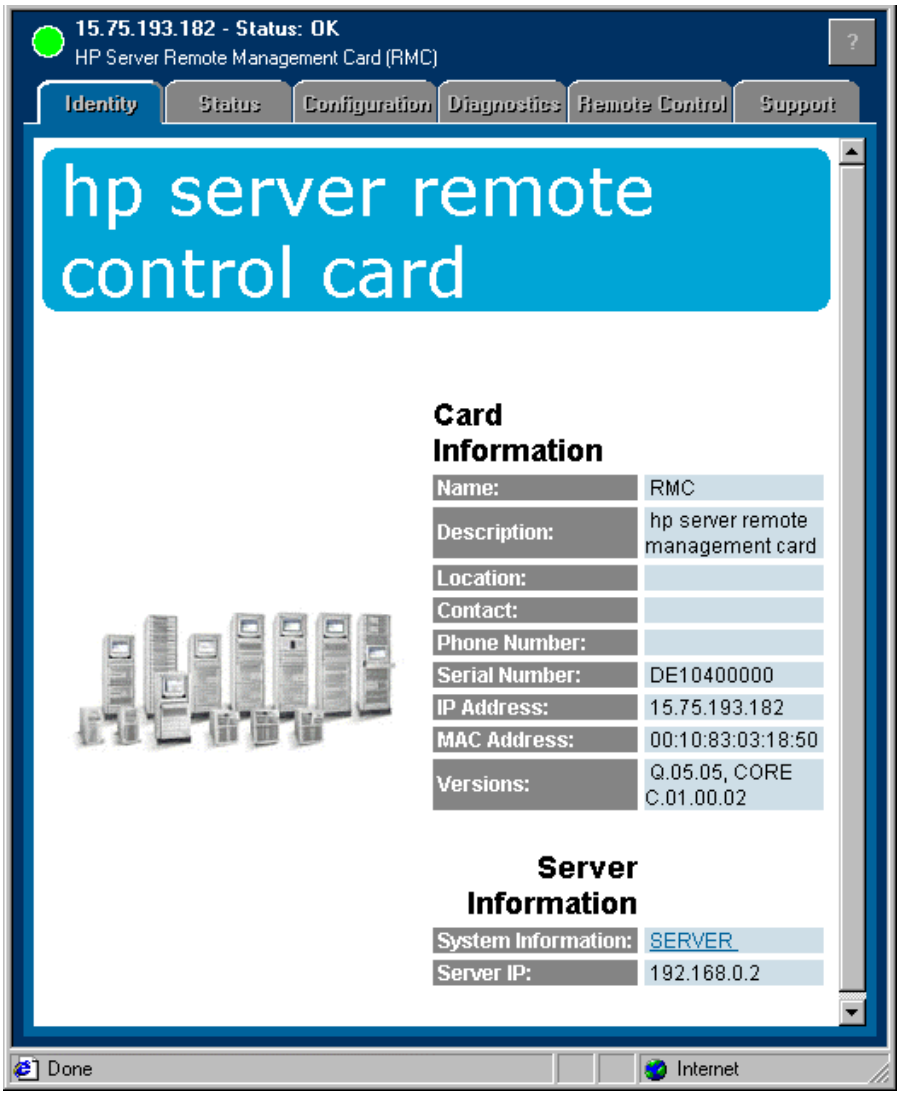


Figure 5-1. Example: HP Server Remote Management Card Identity Page

4. Click the Configuration tab. The login prompt is displayed.
5. In the User Name field, enter a valid administrator name. For your first login, the factory default user name is ADMIN.

6. At the password prompt, enter the password that belongs to the administrator name. For your first login, the factory default password is ADMIN.

NOTE	The user ID and the access password for the HP Server Remote Management Card software are case sensitive.

CAUTION	To avoid a potential security breach allowing someone to log in using the defaults, your first task should be to set up an administrator for the card. Under Configuration\|User, create a new user assigned to the "Administrator" group and assign a new password. Then delete the default ADMIN user account.

7. Once logged into the HP Server Remote Management Card web interface, create your user groups and set your communication and notification preferences. If you have HP Toptools Device Manager, you can perform some administration actions on multiple cards at once. See online help for details (click the "?" button in the upper right corner of the browser window).

Using the HP Server Remote Management Card Web Interface

You can use the HP Server Remote Management Card web interface to remotely manage the server in which you have installed the HP Server Remote Management Card. The following management features are available for setting up and configuring remote control of the HP Server.

NOTE	Up to three users can be logged on to the HP Server Remote Management Card at a time. To log off, using your web browser, shift to another URL. By default, you are automatically logged off after five minutes of card or interface inactivity.

For detailed information about each tab, click the online help button in the upper right corner.

- **Identity.** Description of key information about the HP Server Remote Management Card and the connected server including computer name, description, location, and IP Address.

- **Status.** Provides an Event Log and access to environmental data, including voltage and temperature readings at the server.
- **Configuration.** This is where you set up information about event management (how you will be notified of problems), add users, configure information about the server, and configure information about the card, including LAN and PPP assignments. From here you can also set up a remote firmware update of the HP Server Remote Management Card or you can set up the HP Server to boot using a remote boot image.
- **Diagnostics.** Includes a diagnostic test to scan server memory.
- **Remote Control.** Used to initiate remote control of server functions, including server console redirection, remote shutdown and server reboot. To use these options, you must install the included TFTP software. Refer to Appendix C for details.
- **Support.** Provides listings of additional user resources relative to server configuration and management. Best used when also connected to the World Wide Web for ready access to HP's web pages.
- **Use with Toptools Device Manager.** The HP Server Remote Management Card fully integrates with the Toptools Device Manager product (version 5.0 and above). Access to your HP Server Remote Management Card may be done via accessing a server page of a server that has the HP Server Remote Management Card installed, or through the Others list under Devices|Device Types.

 all s: If you use the HP Server Remote Management Card in a server managed by HP Toptools Device Manager, you can perform “group actions” on multiple HP Server Remote Management Cards by selecting the cards you want with your mouse and right-clicking. Group actions include adding and deleting users, changing user passwords, viewing user configurations, replicating card configurations, powering on and off the server, and updating card firmware.

CAUTION	A special procedure is required when performing group actions on tc3100 and tc4100 servers. This is presented in Appendix G.

Access to the HP Server Remote Management Card management features depend on the privilege level of the user. For detailed information about user privileges, refer to the HP Server Remote Management Card online help.

6 Windows Graphics Console Redirection Using pcAnywhere

For Server systems running Microsoft Windows NT 4.0 or Windows 2000, you can redirect the server's graphics console to a remote PC client to remotely perform operations as if you were sitting at the server. To do this, you must install pcAnywhere software. If you are using the card's LAN connection, you only need to install pcAnywhere on the server. If you are using the card's serial connection via a modem, pcAnywhere components must be installed and configured at *both* the server and the remote client to use Windows remote control. The figure below show how it works:

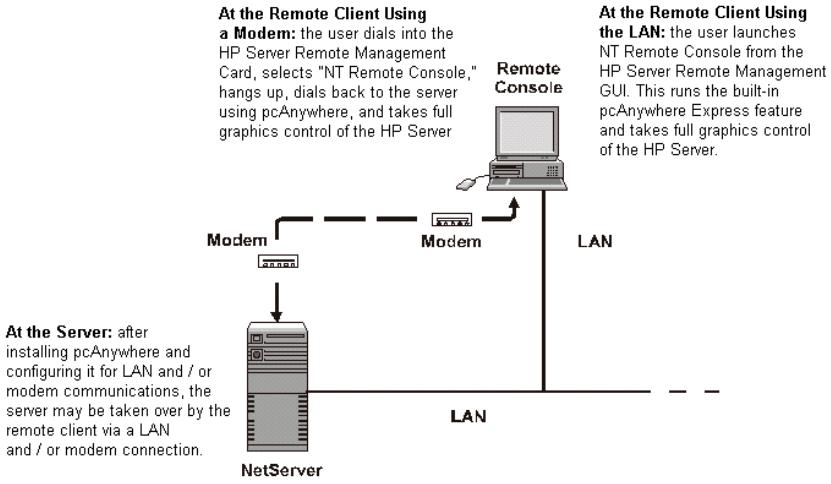


Figure 6-1. Windows Console Redirection to a Remote Client

Installing pcAnywhere on the Server

To enable console redirection (the ability to redirect what's graphically displayed on your server) either over the LAN or via modem, you must first install the pcAnywhere host software, included with your system, on your HP Server.

NOTE Remember that the HP Server Remote Management Card software license authorizes a single administrator for each copy of software (including Symantec's pcAnywhere).

Console Redirection Over a LAN

If you want console redirection (remote control) of your server over a LAN (instead of using a modem with pcAnywhere), you must have TCP/IP software installed on your server. TCP/IP is available with the standard Windows NT product.

Installing pcAnywhere Server Software

Installing pcAnywhere at the server requires administrator privileges in order to configure the program's communications features. Your server must be running either Windows NT 4.0 or Windows 2000.

To install the pcAnywhere software on your Windows server:

1. Log in to Windows with administrator privileges. You need to be the system administrator, or have an account that belongs to the administrator group.
2. Insert the *HP Netserver Navigator CD* (supplied with the HP Server Remote Management Card) in the CD-ROM drive.
3. If you want to run pcAnywhere via the modem connected to the HP Server Remote Management Card, install the appropriate serial driver by running one of the following driver setup programs.

 For Windows NT 4.0, the driver is located in:

 `x:\ttrc2\us\nt40drvr\setup.exe`

 For Windows 2000, the driver is located in:

 `x:\ttrc2\us\win2kdrvr\install.exe`

 where *x:* is the letter of your CD-ROM drive. Follow the on-screen setup instructions.

4. Run the pcAnywhere setup program. From the Windows Start menu, click "Run" and browse to the setup program's location:

 `x:\util\pca32\language\disk1\setup.exe`

 where *x:* is the letter of your CD-ROM drive and *language* is the two letter acronym for your local language (example: us=English, fr=French, ge=German, it=Italian, sp=Spanish). Follow the on-screen setup instructions.

5. When setup is complete, you are prompted to restart. Remove the *HP Netserver Navigator CD* and click OK.

Configuring pcAnywhere Server Software

After you have completed pcAnywhere installation at the server, you need to configure the software to function as a host for graphics console redirection. Once configured and enabled, the HP Server waits for a direct serial connection via the HP Server Remote Management Card's serial port (COM4 by default).

To configure pcAnywhere on the server:

1. Run pcAnywhere. Either double-click the pcAnywhere program icon in the pcAnywhere program group, or access the program from the Start menu.

2. At the pcAnywhere main screen, click the Be a Host PC button.

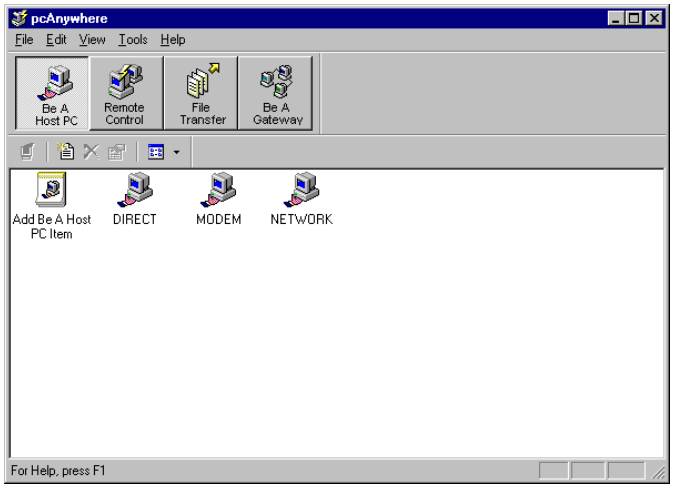


Figure 6-2. pcAnywhere "Be a Host PC" Connection Items

3. To make a new connection item for your server, double-click the "Add Be a Host PC Item".
4. Configure the connection item for LAN or modem use.
 - **LAN connection:** Select TCP/IP as the connection device.
 - **Modem connection:** You will be prompted for a Host Name and connection device. Select the COM port (not modem) assigned by the HP Server Remote Management Card's serial driver (see previous section).

 With your selected COM port highlighted, click Details and check the communications parameters assigned to the port. Configure the port as shown in Figure 6-3.

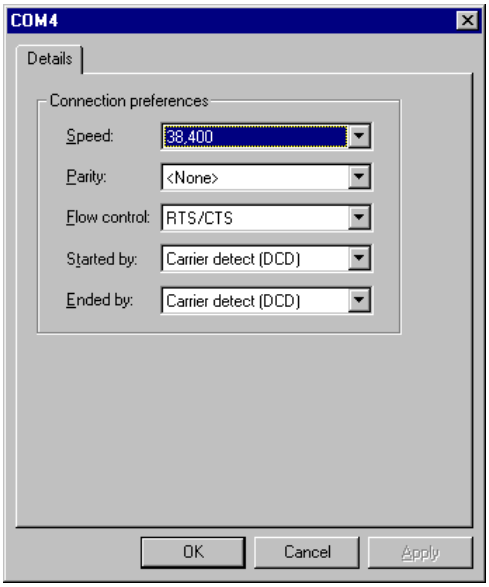


Figure 6-3. Configuring the Server-side COM Port in pcAnywhere

5. Click OK, then Next, and deselect the checkbox to "Automatically launch after wizard," then click Finish. Your new connection item appears in the pcAnywhere main window.
6. Right-click your new connection item and click "Properties".

NOTE You can configure the pcAnywhere host to wait for both a modem and LAN connection by checking both a COM port and TCP/IP in the host icon's "Properties."

7. From the Properties menu, click the Settings tab and check the "Launch with Windows" and "Run minimized" checkboxes. Click OK to return to the main program window.
8. If you want to rename the connection item you just created, right-click the connection item and click Rename. Type in the new name.
9. Close pcAnywhere and restart your server. Once restarted, pcAnywhere is automatically launched and ready to support a remote connection.

You can customize your host configuration to allow for more options and greater security. For example you can create a list of allowed callers, or enable features such as call-back. Refer to pcAnywhere's online help for more information on configuration.

Your pcAnywhere server-side installation and configuration is complete. After restarting Windows NT, pcAnywhere is automatically launched and remains ready, in the background, as an NT service. The server is ready to accept a call from a remote computer running pcAnywhere remote control software.

Installing pcAnywhere on the Remote Client

After you have installed pcAnywhere host software at the HP Server hosting the HP Server Remote Management Card, you need to install the pcAnywhere remote client software *only* if you are connecting via a modem. If you are connecting via the LAN, pcAnywhere Express software is already built into the HP Server Remote Management Card.

NOTE Remember that the software license authorizes the installation of pcAnywhere on *one* remote client and *one* HP Server. If you want to install pcAnywhere on additional systems, purchase additional licenses from Symantec.

The instructions that follow focus on the use of pcAnywhere with the HP Server Remote Management Card. pcAnywhere supports many other additional features that may be useful to you. For details about pcAnywhere's features, refer to the online *pcAnywhere User Guide*.

Console Redirection Over a LAN

Though pcAnywhere does need to be installed on the server, you do not need to install pcAnywhere on your remote console if you are using Console Redirection over the LAN. pcAnywhere Express is already built into the HP Server Remote Management Card (but only supports a LAN connection). You may skip to the "Using NT Graphics Console Redirection" section later in this chapter.

Installing pcAnywhere Remote Client Software (Modem Connection)

pcAnywhere must be already installed and configured as a host on your HP Server before you can initiate a call from your remote client. Refer to "Installing pcAnywhere on the Server" in this chapter for installation and configuration procedures.

Once installed and properly configured, pcAnywhere runs as a startup service on your server and is therefore always ready and waiting for a call from a remote client running pcAnywhere remote client software.

To install pcAnywhere to a remote client running either Windows 95, 98, 2000, or Windows NT 4.0, run the pcAnywhere setup program. Insert the *HP Netserver Navigator CD* into the CD-ROM drive and run setup.exe located in the following directory:

x:\util\pca32*language*\disk1\setup.exe

where *x:* is the letter of the CD-ROM and *language* is the two letter acronym for your local language (example: us=English, fr=French, ge=German, it=Italian, sp=Spanish). Follow the on-screen instructions to complete installation of pcAnywhere software for the client.

Once the software is installed, go to the next section and configure pcAnywhere's remote features to access and graphically redirect your server's console to the remote client.

Configuring pcAnywhere Remote Client Software

The first time you start pcAnywhere, the Smart Setup Wizard helps you configure your system by prompting you for basic information. Configure the connection items depending on the type of connection you want to use. If you wish, you can configure separate LAN and modem connections to the same HP Server.

To configure pcAnywhere at the remote client:

1. Run pcAnywhere either by double-clicking the pcAnywhere program icon (in the pcAnywhere program group), or by accessing it from the Start menu.

2. At the pcAnywhere main screen, click the Remote Control button. You will see the Remote Control connection items displayed.

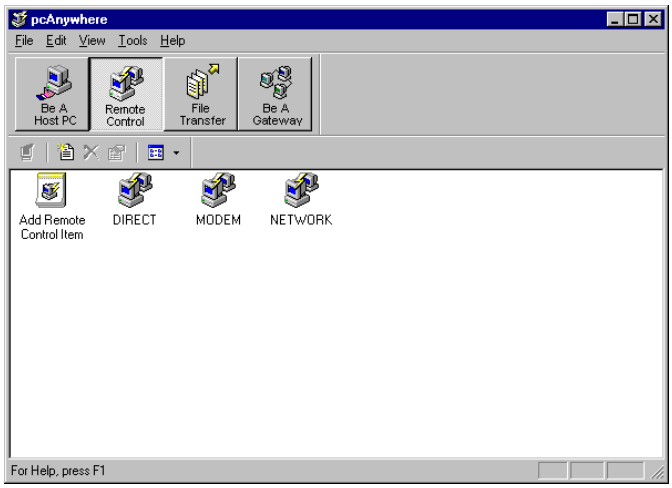


Figure 6-4. pcAnywhere "Remote Control" Connection Items

3. Create a new connection item to access your HP Server by double-clicking the "Add Remote Control Item". An installation Wizard prompts you for information needed to set up a new connection item.
4. The Wizard first prompts you for the name of a "New Host to Call". Enter the name of the HP Server where you installed the HP Server Remote Management Card and click Next.
5. Set up a modem connection item and select an installed modem.

NOTE For both Windows NT and Windows 95, 98 and 2000, you must have a modem already installed to complete the configuration. If the PC you intend to use as the remote client does not have a modem installed and recognized by Windows, you must install one to proceed.

6. Highlight an installed modem from the list of connection devices and click Details. Microsoft Windows presents you with a pre-configured list of Unimodem entries for your selection.
7. Check to be sure that the "Maximum speed" field corresponds to the capabilities of the installed modem you selected.

8. Enter the phone number of the HP Server Remote Management Card's modem, then click Next.
9. Uncheck "Automatically begin remote control session upon Wizard completion", then click Finish.

Customizing Your Connection Items

If you want to rename a connection item, right-click it, select Rename, and type in a new name. You can also copy, paste, and reconfigure a connection item to create an icon for each server you manage.

Installation and configuration of pcAnywhere at the client is now complete. Proceed to the next section for instructions on the use of pcAnywhere to redirect the Windows graphics console.

Using Windows Graphics Console Redirection

From your remote client, to enable graphics console redirection (the ability to redirect what's graphically displayed on your server) either over the LAN or via modem, follow the directions listed below.

For a LAN connection

To initiate Windows remote control via the LAN connection, go through the HP Server Remote Management Card web interface. Under the Remote Control tab, click the "NT Remote Console" button. Note that you must have already set the server's IP address in the "Server Info" screen under the Configuration tab.

pcAnywhere Express will start and redirect the console of your HP Server to your remote client.

For a Modem connection

1. From your remote client, connect to server's Remote Management Card using dial-up networking.
2. Once a connection is established, use your web browser to login to the HP Server Remote Management Card and click the Remote Control tab.
3. Click the "NT Remote Console" button. This switches control of the HP Server Remote Management Card serial port to the server. You have 5 minutes to establish a connection using pcAnywhere before the HP Server Remote Management Card resets the serial port.
4. Hang up the dial-up networking connection. Right-click on the dial-up networking icon on the task bar (shown below) and click "hang up."



5. Start pcAnywhere. Double-click the remote control connection item for the server's Remote Management Card. pcAnywhere connects to the server and begins redirecting the NT console.

For more information on using Windows NT console redirection, or for details about pcAnywhere features, refer to the online *pcAnywhere User Guide*.

7 Troubleshooting

This chapter provides some guidelines for troubleshooting the HP Server Remote Management Card. Different sections highlight difficulties related to:

- Installation problems
- Paging concerns
- Remote client issues

Problems with Installation

The HP Server Remote Management Card does not respond.

Make sure that the HP Server Remote Management Card is securely seated in a PCI slot.

Make sure that the 50-pin cable is connected.

Check the diagnostic LEDs located below the RS-232 port on the back panel of the card. If the green (heartbeat) light is not alternately flashing, something is wrong with the card. See Appendix F, "LED Codes," for more information.

Make sure the server's system BIOS has been updated to the latest release (see Chapter 3 for details).

I can only view two sensors built into my server, but I know that there must be more.

If the function "Show all Sensors" lists PCI Efficiency and PCI Utilization only, check that the cable connection between the HP Server Remote Management Card and the server's motherboard is installed and that both end connectors are securely engaged.

Paging

I generated a test page from the HP Server Remote Management Card Configuration page, but never received it.

Has a pager number and paging string been set up in the HP Server Remote Management Card? Also check to see that the telephone cord is properly connected to the external modem. Verify that the correct cable is properly connected to the card.

If your pager service generates repetitive tones when it answers, the HP Server Remote Management Card modem may interpret the tones as a busy signal and attempt to re-dial. To prevent this, change the *X4* command in the modem initialization string to *X0* (blind dialing).

Can I use the HP Server Remote Management Card to page cellular phones using Short Message Service (SMS)?

SMS (Short Message Service) enhances paging by providing the ability to send and receive short messages up to 160 characters over cellular phones. If your cellular phone service supports the TAP protocol, you can use the HP Server Remote Management Card to send SMS notifications. This is how it works: the HP Server Remote Management Card sends a notification to the provider using TAP, and the mobile service provider transmits the message to the cellular phone using SMS.

A test TAP page initiated by my server was never received by my pager.

The following event codes indicate conditions that interfere with successful paging.

20202: No Connection

Event code 20202 occurs when one of the following conditions is detected:

1. Your terminal is busy and thus was unable to connect.
2. Your modem is not plugged into the phone line.
3. The terminal may be inactive. Paging companies incur occasional down-time as they make upgrades and repairs to their terminals.
4. You may have selected the wrong number for your Terminal Access Number. This number should not be the same as your pager number. After dialing, you should hear standard handshaking protocols begin upon connection.
5. Your modem is having trouble connecting at 300 or 1200 baud. Baud rate difficulties can usually be rectified by entering the correct initialization string for your modem. Modem initialization strings for modems supported by HP are listed in Appendix B.

20203 TAP: No ID=Prompt

Event code 20203 occurs when the terminal does not allow the HP Server Remote Management Card to log on to the terminal system. The most common cause is that your modem is unable to connect at 300 Baud. To correct, see 20202 above (condition number 5).

20204 TAP: No message go ahead

Event code 20204 occurs when the Terminal Logon is not accepted. This indicates that:

1. Your terminal has required more information than the HP Server Remote Management Card is configured to send.
2. Your paging service provider is not completely adhering to the alphanumeric paging protocols. If this appears to be the case, call HP Technical Support.
3. It is also possible that you are not dialing the correct modem access number. Check to see if the number you are dialing responds with typical modem handshaking protocols. If not, call your pager service provider and double-check to be sure you are dialing the correct modem access number (Terminal Number).

20205 TAP: Message not accepted

Event code 20205 occurs when a message is not accepted by the terminal.

1. Your message exceeds the length (number of characters per message) of the service provider's limits. Make sure that your service provider supports a message length of 80 characters.
2. Your Pager ID number is invalid. If you use multiple service providers, make sure you have selected the correct service provider for the Pager ID or PIN number.
3. Your service is currently not accepting messages. Try to send your message later.
4. Call your service provider and ask them to send you a test message. This helps determine if the problem lies with your service provider, or if you are using an invalid Pager ID number.

I generated an e-mail test page using the HP Server Remote Management Card and never received it.

Has an e-mail address and a valid IP address of an SMTP server been set up in the HP Server Remote Management Card? Check with your local network administrator.

Remote Client

I cannot log into the HP Server Remote Management Card from the remote client.

Are you entering the correct password? The login name and password are case sensitive. The factory default login name is ADMIN. Likewise, the factory default login password is ADMIN.

I can no longer communicate with the HP Server Remote Management Card from the remote client.

If DHCP is *enabled* for the HP Server Remote Management Card, the IP address on the card may have changed. Go back into the card's BIOS setup program to view the new IP address, or view the card's new address via HP Toptools Device Manager.

My web browser gives me proxy errors when I try to log into the HP Server Remote Management Card from the remote client.

If your network uses a proxy server for Internet (World Wide Web) access, you may need to bypass it to communicate with your HP Server Remote Management Card. You do this by manually entering the IP address of your HP Server Remote Management Card in the "exceptions" list in your browser's connection preferences.

While using console redirection, I click "NT Remote Console" but do not see any graphics.

Windows graphics console redirection is managed via pcAnywhere. When connected via modem, clicking "NT Remote Console" from the Remote Control page simply redirects control of the HP Server Remote Management Card serial port to the host server. Once that has been done, you hang up the connection and run pcAnywhere on the remote client and dial back into the HP Server Remote Management Card. If your server is running Microsoft Windows NT, its console will be redirected to your remote client.

When connected via LAN, you do not need to use the HP Server Remote Management Card interface. Just launch pcAnywhere and double-click the connection item you set up for your server.

When connected to the HP Server Remote Management Card, I am logged off after several minutes of inactivity.

By default, the HP Server Remote Management Card automatically terminates a connection after five minutes of card or user inactivity. This feature prevents a

user from monopolizing access, especially when the connection is forgotten. This automatic logout feature is not adjustable.

The keys I type from the remote client do not appear on the server screen.

Type in the keyboard lock password to unlock the keyboard. The keyboard will remain unlocked until the next system reboot. If the password does not enable the keyboard, try toggling the Numlock key at the server to enable the numeric keypad.

My power control functions appear to be disabled.

Power control functions are disabled when the server's keyboard lock is on. To turn off keyboard lock, either execute a remote Reset, or type in the keyboard lock password using Text Remote Control. Verify that the ribbon cable is properly connected both to the HP Server Remote Management Card and to the HP Server's system board.

NOTE If you are a member of the "User" group, controlling server power functions is not one of your privileges.

Some of my remote control functions appear to be disabled.

If the server's power goes down, some HP Server Remote Management Card functions that require the server to be powered up are also suspended, including console redirection, PCI Bus Utilization monitoring, and server resets.

The card does not accept a new connection even if I have closed a previous connection.

The HP Server Remote Management Card allows a maximum of 30 HTTP connections to be opened at the same time. If you are closing an HTTP connection it may take about two minutes until the socket disappears. During this time a new connection may be rejected if the total amount of active sockets is greater than 30.

While using the Netscape browser, resizing of the window logs me out.

If the Netscape client browser window displaying the HP Server Remote Management Card page is resized or refreshed, the remote client will be logged out for security reasons. Log in again using your login name and password.

I forgot my password and can no longer log into the card.

If you are the HP Server Remote Management Card administrator and have forgotten your password, there is a special utility on the *HP Netserver Navigator CD* that will allow you to reset the HP Server Remote Management Card user database back to the factory defaults (Login=`ADMIN`, Password=`ADMIN`).

CAUTION	Note that resetting the HP Server Remote Management Card user database back to the factory defaults will erase all existing user account information.

To reset the database, go to the server with the HP Server Remote Management Card. Insert the *HP Netserver Navigator CD* (L.18.20 or above) and reboot the server. Then find and run the *Reset RCC User Database* utility available by clicking the Toolbox icon available from the Navigator Main Menu.

A Event Codes

The table below describes the event codes that can be listed in the event log and optionally directed to specified users via e-mail or pager. When the HP Server Remote Management Card sends notification about a server event, it includes the server identifying number and a five-digit code identifying the event. (If you use email or a TAP pager, you will receive the server name and some descriptive text as well.)

Note that Server Agents software will need to be loaded on your server in order to receive an event notification for most of the events listed below. Refer to the HP Server SNMP agents documentation (viewable via the *HP Server Documentation CD-ROM*) for agent installation and configuration instructions. Refer to the Readme file for Agents software located on the *HP Netserver Navigator CD* under manage\server.

NOTE It's a good idea to copy appropriate sections of this table and keep it with the pager you use to receive notifications. A regularly updated list of HP supported event codes is available on the hp site at: http://www.hp.com, under the Server Troubleshooting section under Technical Support.

Notification and log messages are limited to a length of 40 characters.

Pager Code	Server Event	Severity
001XX	Temperature sensor crossed lower non-critical threshold	WARNING
001XX	Temperature sensor crossed lower critical threshold	CRITICAL
001XX	Temperature sensor crossed lower non-recoverable threshold	CRITICAL
001XX	A temperature inside the server has gone outside the factory specified range.	WARNING
001XX	A temperature inside the server has gone far outside the factory specified range.	CRITICAL
001XX	Temperature sensor crossed upper non-recoverable threshold	CRITICAL
00261	VRM failure	CRITICAL
002XX	A measured voltage in the server has gone outside the factory specified lower voltage range.	WARNING
002XX	A measured voltage in the server has gone far outside the factory specified lower voltage range.	CRITICAL

Pager Code	Server Event	Severity
002XX	Voltage sensor crossed lower non-recoverable threshold	CRITICAL
002XX	A measured voltage in the server has gone outside the factory specified upper voltage range.	WARNING
002XX	A measured voltage in the server has gone far outside the factory specified upper voltage range.	CRITICAL
002XX	Voltage sensor crossed upper non-recoverable threshold	CRITICAL
002XX	System Voltage failure	WARNING
00432	A system fan module error has occurred	WARNING
00432	A system fan module error has occurred	CRITICAL
00432	Fan module failure	WARNING
00432	Fan module failure	CRITICAL
004XX	A fan sensor in the server has gone outside the factory specified range.	WARNING
004XX	A fan sensor in the server has gone far outside the factory specified range.	CRITICAL
004XX	Fan sensor crossed lower non-recoverable threshold	CRITICAL
004XX	Fan sensor crossed upper non-critical threshold	WARNING
004XX	Fan sensor crossed upper critical threshold	CRITICAL
004XX	Fan sensor crossed upper non-recoverable threshold	CRITICAL
004XX	Two or more of the fans in the Processor/PCI Fan Tray have stopped or have been removed.	CRITICAL
004XX	Fan problem in Processor/PCI Fan Tray has been corrected.	INFORMATIONAL
004XX	Two or more of the fans in the Memory Fan Tray have stopped or been removed.	CRITICAL
004XX	Fan problem in the Memory Fan Tray has been corrected.	INFORMATIONAL
004XX	One of the fans in the Memory Fan Tray stopped.	CRITICAL
004XX	One of the fans in the Processor/PCI fan tray stopped.	CRITICAL
00520	I/O area open	WARNING
00530	The server's built-in sensors have detected an open chassis door.	WARNING
00530	Processor area open	WARNING
00600	Front Panel Button Violation	INFORMATIONAL
00700	Processor internal error	CRITICAL
00701	Processor module is operating outside of acceptable margins	WARNING
00701	Processor Thermal Trip Failure	CRITICAL
00702	Processor failed internal self test	CRITICAL
00703	Processor hung during POST	CRITICAL
00704	Processor startup/initialization failed	CRITICAL

Pager Code	Server Event	Severity
00705	Configuration Error in a Processor Slot	CRITICAL
00707	Processor failure	CRITICAL
00708	Processor (#) Disabled	CRITICAL
00709	Processor or Terminator was not detected	CRITICAL
00717	Processor problem	CRITICAL
00718	The Processor in the indicated slot has been disabled by the BIOS.	CRITICAL
00719	A single or multiple ECC Error has been detected on the P6 bus.	WARNING
0071X	CPU internal error	CRITICAL
0071X	CPU Thermal trip	CRITICAL
0071X	CPU hot warning	WARNING
00720	The Processor Card is missing or not properly terminated in indicated processor module.	WARNING
00721	Voltage Regulating Module (VRM) on the indicated processor module had failed.	CRITICAL
00725	CPU mismatch	CRITICAL
00800	Indicated Power Supply has been removed.	WARNING
00800	The indicated Power Supply has been inserted.	INFORMATIONAL
00801	Power supply unit power has failed.	WARNING
00802	Predictive failure/alert in Power supply	WARNING
00816	Redundant Power Supply: Subsystem warning temperature exceeded	WARNING
00817	Temperature alert on designated Power Supply.	CRITICAL
00818	Redundant Power Supply: AC power source failure	CRITICAL
00819	Redundant Power Supply: Protection temperature exceeded, DC shutdown	CRITICAL
00820	Redundant Power Supply: Protection temperature normal, power restored	INFORMATIONAL
00821	Fan failure on designated Power Supply.	CRITICAL
00822	Fan speed-up on designated Power Supply.	WARNING
00823	A power supply's 3.3 volt supply has gone bad.	CRITICAL
00824	A power supply's 5 volt supply has gone bad.	CRITICAL
00825	A power supply's 12 volt supply has gone bad.	CRITICAL
00826	A power supply's -12 volt supply has gone bad.	CRITICAL
00900	Power supply subsystem redundancy gained.	INFORMATIONAL
00901	Power supply subsystem redundancy lost.	WARNING
00902	Power Supply Subsystem: Not enough Power Supply Units detected.	CRITICAL
00904	Power System failure A/C Lost	CRITICAL

Pager Code	Server Event	Severity
00905	Power Supply Subsystem soft failure	CRITICAL
00906	Power Supply Subsystem: Not enough Power Supply Units detected.	CRITICAL
00906	Power Supply Subsystem: Not enough Power Supply Units detected or trouble powering up or down.	CRITICAL
00906	Power Supply Subsystem: Not enough Power Supply Units detected or trouble powering up or down.	CRITICAL
01070	Multiple Fan Failure	CRITICAL
01107	Battery cycles have gone beyond the upper non-critical range	WARNING
01109	Battery cycles have gone beyond the upper critical range	CRITICAL
01111	Battery cycles have gone beyond the upper non-recoverable range	CRITICAL
01200	ECC error corrected in memory module	INFORMATIONAL
01200	A single-bit error has been corrected	INFORMATIONAL
01200	A single-bit error has been corrected	INFORMATIONAL
01201	Predictive failure in a memory module	WARNING
01201	Uncorrectable multibit ECC error has occurred	CRITICAL
01201	Multiple-bit error has occurred	CRITICAL
01201	Multiple-bit error has occurred	CRITICAL
01202	Parity error detected in parity memory	CRITICAL
01202	Parity error detected in parity memory	CRITICAL
01203	Repeated ECC error corrected in memory module	INFORMATIONAL
01203	Single-bit repeated error	INFORMATIONAL
01204	ECC memory module is operating outside of acceptable margins	WARNING
01215	Memory Mirroring switched to Slave Set	WARNING
01216	Faulty row switched to Hot Spare row	WARNING
01300	Hot swap Cage: Drive removed	CRITICAL
01301	Hot swap Cage: Drive inserted	INFORMATIONAL
01320	Hot swap disks: Power connection failure	CRITICAL
01321	Hot swap disks: Temperature emergency	CRITICAL
01322	Hot swap disks: Temperature warning	WARNING
01323	Hot swap disks: Temperature monitor not working	CRITICAL
01400	System memory size reduced due to error in memory slot	WARNING
01520	Post error has occurred	WARNING
01520	Post error has occurred	WARNING
01600	Too many single-bit errors in time period, logging disabled	CRITICAL
01600	Too many single-bit errors in time period, logging disabled	CRITICAL
01601	Too many errors of this type in time period	INFORMATIONAL

Pager Code	Server Event	Severity
01601	Too many errors of this type in time period	INFORMATIONAL
01602	Event log cleared.	INFORMATIONAL
01620	Event log getting full.	INFORMATIONAL
01700	Automatic Server Restart: hard reset after NOS hang	INFORMATIONAL
01701	Automatic Server Restart: hard reset after NOS hang	INFORMATIONAL
01701	Automatic Server Restart: hard reset after NOS hang	INFORMATIONAL
01702	OS Watchdog Shutdown	CRITICAL
01703	Automatic Server Restart: power down after NOS hang	INFORMATIONAL
01703	Automatic Server Restart: power down after NOS hang	INFORMATIONAL
01704	Automatic Server Restart: power cycle after NOS hang	INFORMATIONAL
01704	Automatic Server Restart: power cycle after NOS hang	INFORMATIONAL
01704	Automatic Server Restart: power cycle after NOS hang	INFORMATIONAL
01705	OS Watchdog poweroff	CRITICAL
01706	NOS hang, automatic server restart disabled	INFORMATIONAL
01706	NOS hang, automatic server restart disabled	INFORMATIONAL
01800	System configuration altered by EISA utility	INFORMATIONAL
01801	Server booted and power on self tests completed.	INFORMATIONAL
01801	Server booted and power on self tests completed.	INFORMATIONAL
01802	Uncorrectable chipset error	CRITICAL
01900	NOS memory dump initiated	CRITICAL
01901	One of the bus masters caused a bus timeout	CRITICAL
01901	One of the bus masters caused a bus timeout	CRITICAL
01902	I/0 channel check caused an error	CRITICAL
01902	I/0 channel check caused an error	CRITICAL
01903	Software NMI has been generated	CRITICAL
01903	Software NMI has been generated	CRITICAL
01904	PCI bus error	CRITICAL
01904	PCI bus error	CRITICAL
01905	PCI system error	CRITICAL
01905	PCI system error	CRITICAL
01906	Failsafe timer has timed out	CRITICAL
01907	Correctable data error	INFORMATIONAL
01908	Uncorrectable Bus Error	CRITICAL
01916	IPMB Protocol Error	CRITICAL
02100	SCSI Duplex Board has been removed	WARNING

Pager Code	Server Event	Severity
02101	SCSI Duplex Board has been inserted	INFORMATIONAL
02502	Cache Protocol and Parity error	CRITICAL
02516	ACPI hardware failure	WARNING
0274X	Hot Swap Cage: SCSI Bus type has changed	WARNING
0274X	Hot Swap Cage: SCSI cable removed	WARNING
0274X	Hot Swap Cage: SCSI cable attached	INFORMATIONAL
02840	Hot Swap Cage: SCSI terminator removed	WARNING
02841	Hot Swap Cage: SCSI terminator attached	INFORMATIONAL
03300	PCI Hot Plug fault deasserted	INFORMATIONAL
03300	PCI Hot Plug fault asserted	CRITICAL
03305	PCI Hot Plug powered on	INFORMATIONAL
03305	PCI Hot Plug powered off	INFORMATIONAL
03406	Normal ACPI server shutdown	INFORMATIONAL
19900	Server Management Controller started	INFORMATIONAL
19901	SDR area cleared.	INFORMATIONAL
19902	FRU internal use area cleared	INFORMATIONAL
20000	Failed Remote Management login attempt	WARNING
20001	Remote management user has logged in	INFORMATIONAL
20002	Remote management user logged out	INFORMATIONAL
20003	Remote management user automatically logged out	INFORMATIONAL
20004	Remote management user connection lost	INFORMATIONAL
20005	Remote management user dialback failed	INFORMATIONAL
20006	Integrated RA configuration reset to defaults	WARNING
20100	Remote-initiated <Ctrl-Alt-Del>	INFORMATIONAL
20101	Remote-initiated reset	INFORMATIONAL
20102	Remote-initiated power cycle	INFORMATIONAL
20103	Remote-initiated power down	INFORMATIONAL
20104	Remote-initiated power up	INFORMATIONAL
20105	Automatic power shutdown due to critical condition.	CRITICAL
20106	Front panel power down.	INFORMATIONAL
20107	Automatic graceful shutdown of NOS	WARNING
20108	Remote-initiated graceful shutdown of NOS	INFORMATIONAL
201XX	Voltage Utilization warning	WARNING
201XX	Voltage Utilization error	CRITICAL
20201	Remote management user page: Modem error	INFORMATIONAL

Pager Code	Server Event	Severity
20202	Remote management user page: No Connection	INFORMATIONAL
20203	Remote management TAP page: No ID= prompt	INFORMATIONAL
20204	Remote management TAP page: No message go-ahead	INFORMATIONAL
20205	Remote management TAP page: Message not accepted	INFORMATIONAL
20206	Remote management user Email notification failed	WARNING
20300	Remote Control Card memory test started	INFORMATIONAL
20301	Remote Control Card memory test completed	INFORMATIONAL
20302	Remote Control Card memory test stopped by user	INFORMATIONAL
20303	Remote Control Card memory test error	WARNING
20400	Remote Control Card started	INFORMATIONAL
20401	Remote Control Card internal error	WARNING
20402	Remote Control Card firmware updated	INFORMATIONAL
20403	Remote Control Card battery low	WARNING
20404	Remote Control Card battery disconnected	WARNING
20405	Remote Control Card configuration reset to defaults	WARNING
20406	Remote Control Card: DHCP has assigned a new IP address	WARNING
20901	Front Panel Controller firmware updated	INFORMATIONAL
20902	Primary Hot Swap Cage Controller firmware updated	INFORMATIONAL
20903	Secondary Hot Swap Cage Controller firmware updated	INFORMATIONAL
20905	Server Management Controller firmware updated	INFORMATIONAL
20906	CPU Management Controller firmware updated	INFORMATIONAL
21001	Caution! Your available hard drive space has reached the higher WARNING threshold.	WARNING
21002	Urgent! Your available hard drive space has reached the CRITICAL threshold.	CRITICAL
21008	Note! Your available hard drive space has reached the WARNING threshold.	WARNING
21100	SCSI: SNMP agent being unloaded or stopped	INFORMATIONAL
21101	SCSI: SNMP agent is functioning	INFORMATIONAL
21107	SCSI: Duplicate host adapter ID found	WARNING
21108	SCSI: New host adapter discovered	INFORMATIONAL
21109	SCSI: Host adapter has been changed	INFORMATIONAL
21110	SCSI: Host adapter has failed	CRITICAL
21111	SCSI: Host adapter has been recovered	NORMAL
21112	SCSI: Device no longer found	CRITICAL
21113	SCSI: New device discovered	INFORMATIONAL

Pager Code	Server Event	Severity
21114	SCSI: Device has been recovered	NORMAL
21115	SCSI: Device has changed	INFORMATIONAL
21116	SCSI: Predictive failure condition detected	CRITICAL
21117	SCSI: ASPI database has been cleared	INFORMATIONAL
21118	SCSI: ASPI interface has crashed	CRITICAL
21119	SCSI: Insufficient memory for ASPI operation	WARNING
21120	SCSI: Unable to open ASPI file for writing	WARNING
21121	SCSI: Unable to open ASPI file	WARNING
21122	SCSI: ASPI device file does not exist	WARNING
21123	SCSI: Memory allocation is failing	WARNING
21124	SCSI: Unable to read the database file	WARNING
21125	SCSI: Database is corrupted	WARNING
21126	SCSI: ASPI model initializing	INFORMATIONAL
21130	Scsiflt/SMART: SNMP agent being unloaded or stopped	INFORMATIONAL
21131	SCSIFLT/SMART: SNMP agent is functioning	INFORMATIONAL
21138	A new host adapter has been discovered	INFORMATIONAL
21139	An installed host adapter no longer matches the information stored about it.	INFORMATIONAL
21140	An installed host adapter can no longer be deteced.	CRITICAL
21141	A host adapter that previously failed is now accessible.	NORMAL
21142	An installed SCSI device can no longer be detected.	CRITICAL
21143	A new SCSI device, such as CD-ROM drive, hard drive or tape drive, has been detected.	INFORMATIONAL
21144	An installed SCSI drive that previously failed is now accessible.	NORMAL
21145	SCSI: Device has changed	INFORMATIONAL
21146	SCSI: Predictive failure condition detected	CRITICAL
21147	ScsiSMART: Internal error	INFORMATIONAL
21201	NetRAID: Configuration updated	INFORMATIONAL
21202	NetRAID: Change in state of physical drive	WARNING
21203	NetRAID: Change in state of logical drive	WARNING
21204	NetRAID: Logical drive initialization Started	INFORMATIONAL
21205	NetRAID: Logical drive initialization completed	INFORMATIONAL
21206	NetRAID: Logical drive initialization aborted	WARNING
21207	NetRAID: Logical drive initialization failed	CRITICAL
21208	NetRAID: Logical drive consistency check operation started	INFORMATIONAL
21209	NetRAID: Logical drive consistency check operation completed	INFORMATIONAL

Pager Code	Server Event	Severity
21210	NetRAID: Logical drive consistency check operation aborted	WARNING
21211	NetRAID: Logical drive inconsistencies found and corrected	WARNING
21212	NetRAID: Logical drive consistency check operation failed	CRITICAL
21213	NetRAID: Logical drive reconstruction started	INFORMATIONAL
21214	NetRAID: Logical drive reconstruction completed	INFORMATIONAL
21215	NetRAID: Logical drive reconstruction failed	CRITICAL
21216	NetRAID: Physical drive predictive failure event occurred	CRITICAL
21217	NetRAID: Physical drive predictive failure event occurred	WARNING
21218	NetRAID: Abnormal end to SCSI operation	INFORMATIONAL
21219	NetRAID: New drive inserted	INFORMATIONAL
21220	NetRAID: Backup battery module is missing or disconnected	WARNING
21221	NetRAID: Backup battery module voltage is Low	WARNING
21222	NetRAID: Backup battery module temperature is high	WARNING
21232	HP Disk Array: Write cache error	CRITICAL
21233	HP Disk Array: Logical drive critical	WARNING
21234	HP Disk Array: Logical drive not available	CRITICAL
21235	HP Disk Array: Hot spare disk failed	WARNING
21236	HP Disk Array: Hot spare replacement succeeded	INFORMATIONAL
21237	HP Disk Array: Hard disk failure	WARNING
21238	HP Disk Array: SCSI bus parity error threshold exceeded	WARNING
21239	HP Disk Array: Bad sector threshold exceeded	WARNING
21240	HP Disk Array: Disk array controller hardware error threshold exceeded	WARNING
21241	HP Disk Array: Miscellaneous error threshold exceeded	WARNING
21242	HP Disk Array: Time to replace disk array controller	INFORMATIONAL
21301	The installed LAN adapter no longer matches the configuration information stored about it.	WARNING
21320	The LAN adapter has detected a number of receive errors higher than the threshold level.	WARNING
21321	The LAN adapter has detected a number of transmit errors higher than the threshold level.	WARNING
21322	The LAN adapter installed in the server has reset itself.	CRITICAL
21323	The LAN adapter has detected a network protocol problem.	WARNING
21324	The LAN adapter has detected a packet length error.	WARNING
21325	The LAN adapter has detected a number of packet length errors higher than threshold level.	WARNING

Pager Code	Server Event	Severity
21326	The LAN adapter has detected a number of late collision errors higher than the threshold level.	WARNING
21327	The LAN adapter has detected a number of packet collisions higher than the threshold level. This usually indicates a busy network.	WARNING
21328	The LAN adapter has detected a network fault. Data transmission was stopped.	WARNING
21329	The LAN adapter has detected a busy network.	WARNING
21330	The LAN adapter has detected a performance problem associated with an inadequate number of receive buffers.	WARNING
21331	The LAN adapter has detected a performance problem associated with an inadequate number of receive buffers.	CRITICAL
21332	The LAN adapter has detected that the total number of packets handled during a processing interval has reached a threshold level.	INFORMATIONAL
21340	The LAN adapter has detected a number of receive errors higher than the threshold level.	WARNING
21341	The LAN adapter has detected a number of transmit errors higher than the threshold level.	WARNING
21342	The LAN adapter installed in the server has reset itself.	CRITICAL
21343	The LAN adapter has detected a network protocol problem.	WARNING
21344	The LAN adapter has detected a packet length error.	WARNING
21345	The LAN adapter has detected a number of packet length errors higher than threshold level.	WARNING
21346	The LAN adapter has detected a number of late collision errors higher than the threshold level.	WARNING
21347	The LAN adapter has detected a number of packet collisions higher than the threshold level. This usually indicates a busy network.	WARNING
21348	The LAN adapter has detected a network fault. Data transmission was stopped.	WARNING
21349	The LAN adapter has detected a busy network.	WARNING
21350	The LAN adapter has detected a performance problem associated with an inadequate number of receive buffers.	WARNING
21351	The LAN adapter has detected a performance problem associated with an inadequate number of receive buffers.	CRITICAL
21352	The LAN adapter has detected that the total number of packets handled during a processing interval has reached a threshold level.	INFORMATIONAL
21353	The active NIC in a redundant group has failed. The standby NIC has taken over.	WARNING
21354	A previously failed NIC in a redundant group has become operational.	INFORMATIONAL
21355	The standby NIC in a redundant group has failed.	WARNING

Pager Code	Server Event	Severity
21356	All NICs (active and standby) in a redundant group have failed.	CRITICAL
21360	The LAN adapter has detected a number of receive errors higher than the threshold level.	WARNING
21361	The LAN adapter has detected a number of transmit errors higher than the threshold level.	WARNING
21362	The LAN adapter installed in the server has reset itself.	CRITICAL
21363	The LAN adapter has detected a network protocol problem.	WARNING
21364	The LAN adapter has detected a packet length error.	WARNING
21365	The LAN adapter has detected a number of packet length errors higher than threshold level.	WARNING
21366	The LAN adapter has detected a number of late collision errors higher than the threshold level.	WARNING
21367	The LAN adapter has detected a number of packet collisions higher than the threshold level. This usually indicates a busy network.	WARNING
21368	The LAN adapter has detected a network fault. Data transmission was stopped.	WARNING
21369	The LAN adapter has detected a busy network.	WARNING
21370	The LAN adapter has detected a performance problem associated with an inadequate number of receive buffers.	WARNING
21371	The LAN adapter has detected a performance problem associated with an inadequate number of receive buffers.	CRITICAL
21372	The LAN adapter has detected that the total number of packets handled during a processing interval has reached a threshold level.	INFORMATIONAL
21401	Tape Drive : Problems reading data	WARNING
21402	Tape Drive : Problems writing data	WARNING
21403	Tape Drive : Read or write data error	WARNING
21404	Tape Drive : Faulty media detected	CRITICAL
21405	Tape Drive : Tape device may have read fault - call helpline	CRITICAL
21406	Tape Drive : Tape device may have write fault - call helpline	CRITICAL
21407	Tape Drive : Tape cartridge has reached the end of its useful life	WARNING
21408	Tape Drive : The tape cartridge is not data-grade	WARNING
21409	Tape Drive : Attempting write to a write-protected cartridge	CRITICAL
21410	Tape Drive : Cannot eject the cartridge while tape drive is in use	INFORMATIONAL
21411	Tape Drive : The tape in the drive is a cleaning cartridge	INFORMATIONAL
21412	Tape Drive : Attempt to load cartridge of a type which is not supported	INFORMATIONAL
21413	Tape Drive : The tape in the drive has snapped	CRITICAL
21414	Tape Device Has Detected Snapped Tape	CRITICAL

Pager Code	Server Event	Severity
21415	Tape Device Has Memory Chip in Cartridge Failure	WARNING
21416	Tape Cartridge Ejected While Actively Writing/Reading	CRITICAL
21417	Tape Device Has Detected Read Only Media	WARNING
21418	Tape Device Has Detected Corrupted Directory On Tape	WARNING
21420	Tape Drive : The tape drive needs cleaning	CRITICAL
21421	Tape Drive : The tape drive is due for routine cleaning	WARNING
21422	Tape Drive : The last cleaning cartridge used in tape drive has worn out	CRITICAL
21423	Tape Device Has Detected Invalid Cleaning Cartridge	CRITICAL
21429	Tape Device Requires Preventative Maintenance	WARNING
21430	Tape Drive : The tape drive has a hardware fault - reset drive	CRITICAL
21431	Tape Drive : The tape drive has a hardware fault - call helpline	CRITICAL
21432	Tape Drive : The tape drive has a problem with the SCSI interface	WARNING
21433	Tape Drive : The operation has failed. Eject media and reload.	CRITICAL
21434	Tape Drive : Attempt to use incorrect firmware for this tape drive	WARNING
21435	Tape Device Humidity Specification Exceeded	WARNING
21436	Tape Device Temperature Specification Exceeded	WARNING
21437	Tape Device Voltage Specification Exceeded	WARNING
21438	Tape Device Predicted to Fail - Call Helpline	CRITICAL
21439	Tape Device May Have Hardware Fault - Run Diagnostics	WARNING
21440	Tape Drive : Autoloader communications fault	CRITICAL
21441	Tape Drive : Stray tape detected in autoloader	CRITICAL
21442	Tape Drive : There is a problem with the autoloader mechanism	WARNING
21443	Tape Drive : The autoloader door is open	CRITICAL
21444	Autoloader Has Hardware Fault - Call Helpline	CRITICAL
21445	Autoloader Cannot Operate Without Magazine	CRITICAL
21446	Autoloader Predicted to Fail - Call Helpline	WARNING
21450	Library Has Drive Communications Fault	CRITICAL
21451	Library Has Changer Mechanism Fault	WARNING
21452	Library Has Hardware Fault - Reset Library	CRITICAL
21453	Library Has Hardware Fault - Call Helpline	CRITICAL
21454	Library May Have Hardware Fault - Run Diagnostics	WARNING
21455	Library Has Host Interface Fault	CRITICAL
21456	Library Predicted to Fail - Call Helpline	WARNING
21457	Library Requires Preventative Maintenance	WARNING

Pager Code	Server Event	Severity
21458	Library Humidity Specification Exceeded	CRITICAL
21459	Library Temperature Specification Exceeded	CRITICAL
21460	Library Voltage Specification Exceeded	CRITICAL
21461	Library Detects Stray Tape In Drive	CRITICAL
21462	Library Has Problems Picking Cartridge from Slot	WARNING
21463	Library Has Problems Placing Cartridge into Slot	WARNING
21464	Library Has Problems Loading Cartridge into Drive	WARNING
21465	Library Door is Open	CRITICAL
21466	Library Has Mechanical Fault with Mailslot	CRITICAL
21467	Library Cannot Operate Without Magazine	CRITICAL
21468	Library Security Has Been Compromised	WARNING
21469	Library Security Mode Changed	INFORMATIONAL
21470	Library Manually Turned Offline	INFORMATIONAL
21471	Library Drive Turned Offline	INFORMATIONAL
21472	Library Has Problems Reading Barcode Labels	WARNING
21473	Library Inventory is Inconsistent	CRITICAL
21474	Invalid Library Operation Attempted	WARNING
21501	Uninterrupted Power Supply: Communication lost between agent and UPS	CRITICAL
21502	Uninterrupted Power Supply: Load greater than rated capacity	CRITICAL
21503	Uninterrupted Power Supply: UPS has failed its internal self-test	CRITICAL
21504	Uninterrupted Power Supply: UPS batteries are discharged	CRITICAL
21505	Uninterrupted Power Supply: UPS has switched to battery backup power	CRITICAL
21506	Uninterrupted Power Supply: UPS has enabled SmartBoost	WARNING
21507	Uninterrupted Power Supply: Batteries are low and will soon be exhausted	CRITICAL
21508	Uninterrupted Power Supply: Communication established with UPS	INFORMATIONAL
21509	Uninterrupted Power Supply: Normal power has been restored to the UPS	INFORMATIONAL
21510	Uninterrupted Power Supply: UPS has passed its internal self-test	INFORMATIONAL
21511	Uninterrupted Power Supply: UPS has returned from a low battery condition	INFORMATIONAL
21513	Uninterrupted Power Supply: UPS is entering sleep mode	CRITICAL
21517	Uninterrupted Power Supply: UPS batteries require immediate replacement	CRITICAL
21518	Uninterrupted Power Supply: Measure-UPS contact changed from	CRITICAL

Pager Code	Server Event	Severity
	default state	
21519	Uninterrupted Power Supply: Measure-UPS contact returned to default state	INFORMATIONAL
21520	Uninterrupted Power Supply: UPS is on bypass due to hardware failure	CRITICAL
21521	Uninterrupted Power Supply: UPS put on bypass via software or front panel	WARNING
21522	Uninterrupted Power Supply: UPS put on bypass via rear UPS switch	WARNING
21523	Uninterrupted Power Supply: UPS has returned from bypass mode	INFORMATIONAL
21524	Uninterrupted Power Supply: Base module bypass power supply needs repair	CRITICAL
21525	Uninterrupted Power Supply: Base module fan needs repair	CRITICAL
21526	Uninterrupted Power Supply: Communication lost with external battery packs	WARNING
21527	Uninterrupted Power Supply: Communication established with external battery packs	INFORMATIONAL
21528	Uninterrupted Power Supply: Battery run-time calibration test initiated	INFORMATIONAL
21600	The NetWare Loadable Module (NLM) that detects SCSI faults has been unloaded.	INFORMATIONAL
21605	An installed host adapter can no longer be detected.	CRITICAL
21606	An installed SCSI device can no longer be detected.	CRITICAL
21608	A new host adapter has been discovered.	INFORMATIONAL
21609	An installed host adapter no longer matches the information stored about it.	INFORMATIONAL
21610	An installed host adapter can no longer be detected.	CRITICAL
21611	A host adapter that previously failed is now accessible.	NORMAL
21612	An installed SCSI device can no longer be detected.	CRITICAL
21613	A new SCSI device, such as a CD-ROM drive, hard drive or tape drive, has been detected.	INFORMATIONAL
21614	An installed SCSI device that previously failed is now accessible.	NORMAL
21615	An installed SCSI device no longer matches the information stored about it.	INFORMATIONAL
21625	The SCSI monitoring software on the server has determined that the device database is corrupt.	CRITICAL
21816	An unrecognized HW log event was detected.	INFORMATIONAL
21900	FCArray: A physical device became online.	INFORMATIONAL
21901	FCArray: A hard disk has been added as a hot spare.	INFORMATIONAL

Pager Code	Server Event	Severity
21902	FCArray: Hard disk error found.	CRITICAL
21903	FCArray: Hard disk PFA condition found, drive may fail.	WARNING
21904	FCArray: An automatic rebuild has started.	INFORMATIONAL
21905	FCArray: A manual rebuild has started.	INFORMATIONAL
21906	FCArray: Rebuild completed.	INFORMATIONAL
21907	FCArray: Rebuild cancelled.	INFORMATIONAL
21908	FCArray: Rebuild stopped with errors.	CRITICAL
21909	FCArray: Rebuild failed due to new physical device.	CRITICAL
21910	FCArray: Rebuild failed due to logical device failure.	CRITICAL
21911	FCArray: A physical device failed.	CRITICAL
21912	FCArray: A physical device was found.	INFORMATIONAL
21913	FCArray: A physical device is gone.	INFORMATIONAL
21914	FCArray: A physical device is unconfigured.	INFORMATIONAL
21915	FCArray: Expand capacity started.	INFORMATIONAL
21916	FCArray: Expand capacity finished.	INFORMATIONAL
21917	FCArray: Expand capacity failed.	CRITICAL
21918	FCArray:Command to physical device timed out.	CRITICAL
21919	FCArray:Physical device command aborted.	CRITICAL
21920	FCArray:Command was retried.	INFORMATIONAL
21921	FCArray:Parity error.	INFORMATIONAL
21922	FCArray:Soft error.	INFORMATIONAL
21923	FCArray: Miscellaneous error.	INFORMATIONAL
21924	FCArray: Physical device reset.	INFORMATIONAL
21925	FCArray: A physical device became and active spare.	INFORMATIONAL
21926	FCArray: A physical device became a warm spare.	INFORMATIONAL
21927	FCArray: Request sense data present.	INFORMATIONAL
21928	FCArray: Consistency check started.	INFORMATIONAL
21929	FCArray: Consistency check completed with no errors.	INFORMATIONAL
21930	FCArray: Consistency check cancelled.	WARNING
21931	FCArray: Consistency check completed with an error.	CRITICAL
21932	FCArray: Consistency check failed due to logical device.	CRITICAL
21933	FCArray: Consistency check failed due to physical device.	CRITICAL
21934	FCArray: Logical device became offline.	CRITICAL
21935	FCArray: Logical device became critical.	CRITICAL
21936	FCArray: Logical device became online.	INFORMATIONAL

Pager Code	Server Event	Severity
21937	FCArray: automatic rebuild started.	INFORMATIONAL
21938	FCArray: Manual rebuild started.	INFORMATIONAL
21939	FCArray: Rebuild completed.	INFORMATIONAL
21940	FCArray: Rebuild cancelled.	INFORMATIONAL
21941	FCArray: Rebuild error.	CRITICAL
21942	FCArray: Rebuild failed due to new physical device.	CRITICAL
21943	FCArray: Rebuild failed due to logical device failure.	CRITICAL
21944	FCArray: A logical device initialization started.	INFORMATIONAL
21945	FCArray: A logical device initialization completed.	INFORMATIONAL
21946	FCArray: A logical device initialization was cancelled.	INFORMATIONAL
21947	FCArray: A logical drive initialization failed.	CRITICAL
21948	FCArray: A logical device was found.	INFORMATIONAL
21949	FCArray: A logical device is gone.	INFORMATIONAL
21950	FCArray: Expand capacity started.	INFORMATIONAL
21951	FCArray: Expand capacity finished.	INFORMATIONAL
21952	FCArray: Expand capacity failed.	CRITICAL
21953	FCArray: Bad block was found.	WARNING
21954	FCArray: A system drive size changed.	INFORMATIONAL
21955	FCArray: A system device type changed.	INFORMATIONAL
21956	FCArray: A bad block was found on a logical device.	INFORMATIONAL
21957	FCArray: System started.	INFORMATIONAL
21958	FCArray: Write back error.	CRITICAL
21959	FCArray: State table is full.	INFORMATIONAL
21960	FCArray: Controller is dead.	INFORMATIONAL
21961	FCArray: Controller has reset.	INFORMATIONAL
21962	FCArray: A controller was found.	INFORMATIONAL
21963	FCArray: A controller is gone.	INFORMATIONAL
21964	FCArray: Battery Backup Unit found.	INFORMATIONAL
21965	FCArray: Battery Backup Unit power is low.	WARNING
21966	FCArray: Battery Backup Unit power is OK.	INFORMATIONAL
21967	FCArray: Controller has been powered off.	CRITICAL
21968	FCArray: Controller has been powered on.	INFORMATIONAL
21969	FCArray: Controller Online.	INFORMATIONAL
21970	FCArray: Controller offline.	CRITICAL
21971	FCArray: Controller's partner is gone.	CRITICAL

Pager Code	Server Event	Severity
21972	FCArray: Battery Backup Unit Recondition Started.	INFORMATIONAL
21973	FCArray: Battery Backup Unit recondition finished.	INFORMATIONAL
21974	FCArray: Battery Backup Unit Recondition Cancelled.	INFORMATIONAL
21975	FCArray: Physical device size table is full.	INFORMATIONAL
21976	FCArray: Storage cabinet fan failed.	CRITICAL
21977	FCArray: Storage cabinet fan is OK.	INFORMATIONAL
21978	FCArray: Drive enclosure fan failed.	CRITICAL
21979	FCArray: Storage cabinet fan is not present.	INFORMATIONAL
21980	FCArray: Storage cabinet power supply failed.	CRITICAL
21981	FCArray: Storage cabinet power supply is OK.	INFORMATIONAL
21982	FCArray: Storage cabinet power supply is not present.	INFORMATIONAL
21983	FCArray: Storage cabinet too hot.	CRITICAL
21984	FCArray: Storage cabinet is hot.	CRITICAL
21985	FCArray: Storage cabinet temperature is OK.	INFORMATIONAL
21986	FCArray: Cabinet temp sensor not present.	INFORMATIONAL
22300	NETRAID: Container updated	INFORMATIONAL
22301	NETRAID: Container General Error	CRITICAL
22302	NETRAID: Container not mirroring	CRITICAL
22303	NETRAID: Container Mirror failover no space	CRITICAL
22304	NETRAID: Mirror failover started	INFORMATIONAL
22305	NETRAID: Mirror failover failure	CRITICAL
22306	NETRAID: Mirror no rebuild space	WARNING
22307	NETRAID: Mirror drive failure	CRITICAL
22308	NETRAID: RAID-5 rebuild started	INFORMATIONAL
22309	NETRAID: RAID-5 drive failure	CRITICAL
22310	NETRAID: RAID-5 no failover device	WARNING
22311	NETRAID: RAID-5 no failover space	CRITICAL
22312	NETRAID: Snapshot almost full	WARNING
22313	NETRAID: Snapshot full	WARNING
22314	NETRAID: RAID-5 rebuild done	INFORMATIONAL
22315	NETRAID: Battery Recon Required	INFORMATIONAL
22316	NETRAID: Enclosure Failure	WARNING
22317	NETRAID: Enclosure Fan Failure	WARNING
22318	NETRAID: Enclosure power supply failure	WARNING
22319	NETRAID: Enclosure Bad Temperature	WARNING

Pager Code	Server Event	Severity
22320	NETRAID: Enclosure temperature over threshold	INFORMATIONAL
22321	NETRAID: Battery dead	CRITICAL
22322	NETRAID: Battery degraded	WARNING
22323	NETRAID: Failure predicted	WARNING
22324	NETRAID: Device warning	WARNING
22325	NETRAID: Device Temp Warning	WARNING
22326	NETRAID: Device Degraded	WARNING
22327	NETRAID: Drive letter changed	INFORMATIONAL
22328	NETRAID: Failover disk changed	INFORMATIONAL
22331	NETRAID: File System changed	INFORMATIONAL
22332	NETRAID: Disk failure	CRITICAL
22333	NETRAID: Normal I/O Resumed	INFORMATIONAL
22334	NETRAID: SNMP Agent Started	INFORMATIONAL
22335	NETRAID: Battery Charge Improving	INFORMATIONAL
22336	NETRAID: Battery charge is adequate	INFORMATIONAL
22337	NETRAID: Normal I/O Operations paused	INFORMATIONAL
22338	NETRAID: New Container Created	INFORMATIONAL
22339	NETRAID: Container Deleted	INFORMATIONAL
22340	NETRAID: Failure prediction tested	INFORMATIONAL
22341	NETRAID: Failure prediction threshold changed	INFORMATIONAL

B Tested Modems

For modem connection to the HP Server Remote Management Card, an external modem is required. HP recommends that you use the same model (or at least the same brand) of modem at the remote client that you use at the server. A list of tested modems with their initialization strings for PPP communication and numeric paging is listed in Table B-1 below.

Table B-1. Tested Modems and Initialization Strings

Modem Model	Initialization String (for PPP and Numeric Paging)
Generic Hayes Compatible	ATQ0V1X4S0=3&C1&D2
Diamond SupraExpress 56e SP (K56Flex)	ATQ0V1X4S0=3&K3&C1\N2%C3+MS=V34
Hayes Optima 33.6	ATQ0V1X4S0=3&K3&C1&Q5&D3S36=7B33
Hayes Accura 56K+FAX(K56Flex)	ATQ0V1X4S0=3&K3&C1&Q5%C3B0&D3S37=0
Motorola ModemSURFR 56K	ATQ0V1X4S0=3&K3&C1%C2%C3+MS=11
MultiTech MT1432L	ATQ0&Q1V1X4S0=3&E4&C1$BA0&E1&E13&D3B0
MultiTech MT2834BA	ATQ0&Q1V1X4S0=3&E4&C1$BA0&E1&E13&D3B0
MultiTech MT5600ZDXV (K56flex)	ATQ0V1X4S0=3&K3&C1&Q5\N2%C3&D3B0+MS=11
Microcom DeskPorte 28.8S/14.4S	ATQ0V1X4S0=3\G0&K3&C1&Q5%C3&D3B0+MS=11,1
USR Sportster 56K Faxmodem(X2)	ATQ0V1X4S0=3&H1&R2&C1&B1&M5&K2&D3B0&N0
USR Sportster 33.6 Faxmodem	ATQ0V1X4S0=3&H1&R2&C1&B1&M5&K2&D3B0&N0
USR Courier V.Everything 33.6/28.8	ATQ0&A1V1X4S0=3&H3&R2&I0&C1&B1&M5&K1&D2B0&N0
ZyXEL Omni 288S	ATQ0V1X4S0=3&H3&C1&B1&K4&D3B0&N0

C Installing and Using TFTP

Overview: What Is TFTP?

TFTP, the Trivial File Transfer Protocol, allows the HP Server Remote Management Card to access boot floppy images and new firmware images stored at a LAN or modem-connected computer. TFTP is built on top of TCP/IP and is functionally a subset of FTP. As its name indicates, this protocol is used to transfer data between a "TFTP server" and either the HP Server Remote Management Card or some other device that acts as the "TFTP client."

NOTE TFTP and the HP Server Remote Management Card depend on the TCP/IP protocol. If you are able to view the HP Server Remote Management Card user interface on your remote computer, this protocol is already functioning correctly. If not, modification of either your browser or networking environment may be required.

The HP Server Remote Management Card uses the TFTP service to:

- Access boot floppy images that allow administrators to help diagnose HP Server problems and update the server BIOS.
- Update the HP Server Remote Management Card firmware.

TFTP file transfer consists of client-side and server-side components. Because the HP Server Remote Management Card has the client TFTP service built into its firmware, you can use TFTP to transfer either firmware images or boot images from either a local or a remote computer running a TFTP server program, see Figure C-1.

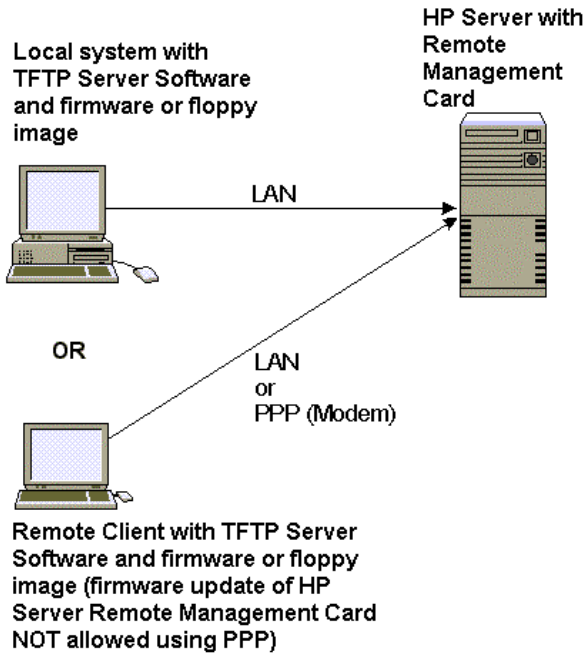


Figure C-1. Using TFTP to Remotely Supply Updates and Boot Images

TFTP server side software for Windows 95, 98, or 2000 and Windows NT is supplied on the *HP Netserver Navigator CD* as the file:

```
\ttrc\us\tftpserv.exe
```

The server software is designed only to serve files to a TFTP client, not to receive them. The software provides additional security by allowing the client to retrieve files only from a directory which is designated on the command line when starting the server.

NOTE	Contact your local network administrator for the correct TFTP server setup and for available boot images.

For any of the following operations you may also use another available TFTP server such as the TFTP server daemon normally supplied with UNIX workstations and servers.

TFTP Requirements

To use the TFTP service with the HP Server Remote Management Card, you must have:

- **TFTP client software.** The client software is already built into the firmware of the HP Server Remote Management Card.
- **TFTP server software (tftpserv.exe).** To run *tftpserv* you need one of the following operating systems:
 - ◊ Microsoft Windows NT 4.0
 - ◊ Microsoft Windows 95, 98, ME or 2000

TFTP server software requires TCP/IP availability on the computer on which it will run.

Starting the TFTP Server

To start the supplied TFTP server, you must execute the program "tftpserv.exe" on the server in a DOS window or using the Run… command from the Windows Start menu. Usage is as follows:

```
tftpserv.exe [root]
```

where [*root*] indicates the base directory from which a client can retrieve files. If you do not specify [*root*], the directory containing the tftpserv.exe file is used as the base directory.

A TFTP client can request files within the base directory or its subdirectories but does not have access to lower directories. The server software enables the base directory to act only as a file source, not as a file destination.

Updating the HP Server Remote Management Card Firmware

If a new or backup version of the HP Server Remote Management Card firmware is stored on the TFTP server, you can download the update to your HP Server Remote Management Card. This must be done over the LAN. Firmware update of the HP Server Remote Management Card is *not* supported using a PPP connection.

To update the HP Server Remote Management Card firmware, you must have a firmware image file stored under the base directory used by the TFTP server.

NOTE This option may be performed on a single card or, if you have Toptools Device Manager, multiple cards at once. Instructions for a single card are listed here. To perform this action on

multiple cards, refer to the HP Server Remote Management Card online help.

1. From the HP Server Remote Management Card software interface, click the Configuration tab.
2. Then click the Card Info button.
3. In the Card Maintenance section, fill in the IP address of the TFTP server and the filename of the firmware. The filename you enter should include a relative path from the base directory.
4. Ensure the TFTP server is running.
5. To start the firmware update, click Update.

For example, if the TFTP server used *\tftp\public* as its root and the firmware image file is named

```
\tftp\public\hp\fw\ttrc\us\ttrc_rom.bin
```

you would enter the file name as:

```
hp\fw\ttrc\us\ttrc_rom.bin
```

An update can also be performed using a firmware image file and TFTP server at a remote client (see Figure C-1).

NOTE HP recommends that you do not update the HP Server Remote Management Card firmware if the link between the TFTP server and the HP Server is a dial-up network connection. A disconnection during an update can leave the HP Server Remote Management Card partially updated and you would need to repeat the update before proceeding.

A firmware update takes approximately one minute over a 10Base-T LAN connection. After the update has completed, the HP Server Remote Management Card will be reset in order to start the new firmware.

Using the HP Server Remote Management Card Remote Boot Feature

You can use the HP Server Remote Management Card to remotely boot the HP Server in which you have installed the HP Server Remote Management Card. The card boots the HP Server using a boot floppy image located on a TFTP server.

Starting an HP Server from a remote boot image requires that you have already created an alternate bootable floppy image file and that this image is available in the base directory used by the TFTP server. After the HP Server Remote Management Card processes a remote reboot, the feature is disabled automatically so that the next boot will be a local boot.

You use the HP Copydisk utility to create a floppy image file. The 1.44MB file created contains a sector-by-sector copy of the floppy plus a 32-byte Copydisk header; you can also use generic floppy image files (no header) created with other utilities. The image file (usually with the extension .DSK), when accessed via TFTP, is interpreted by the HP Server with the HP Server Remote Management Card as if it were a local floppy disk image. Thus, the HP Server boots using this image as if it were accessing a bootable disk stored in floppy drive A.

The ability to create a floppy boot image opens up powerful remote administration possibilities. A system administrator can create boot floppy images to:

- update the server BIOS
- change and/or update software drivers
- boot your various diagnostic utilities
- boot virus-checking software

NOTE Check the HP Server's BIOS Setup program (typically, accessed by pressing F2 when prompted during the boot process) to ensure that the floppy drive is positioned at the top of the list of bootable devices in the boot order.

Creating a Floppy Boot Image

Before you can create a boot image, you must get a copy of the HP utility "copydisk.exe".

NOTE Do not confuse HP's *copydisk.exe* with the DOS utility *diskcopy.exe* supplied with Microsoft MS-DOS operating systems.

Copydisk can be found on the *HP Netserver Navigator CD* in the directory

```
\ttrc\us
```

In the following procedure, you format a floppy disk to include system (boot) capability and load the software (drivers, applications) that you want run during the boot process. Finally when you have provided all necessary software components to the disk, you copy an image of the floppy to your TFTP server using copydisk.exe.

To create a floppy boot image:

1. Insert a 1.44MB floppy disk in drive A and format it. This could be at a Windows 95, 98 or 2000 client, but to ensure that the diskette has enough room for all the files, use a system with MS-DOS 6.x. At a DOS prompt: enter the command

   ```
   format /s a:
   ```

 The /s parameter instructs DOS to include the system on the disk, making the disk bootable.

2. Copy all drivers and software (e.g. BIOS update) to the floppy disk drive. Create an appropriate autoexec.bat file on the floppy to run the desired program(s).

3. Using the HP Copydisk utility, create a floppy boot image file in the root directory of your TFTP server. Use the following syntax:

 `copydisk a: x:\path\filename.dsk`

 where *a:* is the source diskette and *x:\path\filename* is the destination drive, path and filename with a .dsk extension for your image file. An image file is created and transferred to the designated directory.

Initiating a Remote Boot Using a Floppy Boot Image

There are two ways to boot the HP Server using a remote boot image:

- Remote Boot Option 1 requires "hands-on" access at the HP Server.
- Remote Boot Option 2 uses the HP Server Remote Management Card web interface.

Remote Boot Option 1

To use Remote Boot Option 1 method, you must have properly configured the HP Server Remote Management Card. Refer to "Running the HP Server Remote Management Card BIOS Setup Program" in Chapter 4.

In Remote Boot Option 1, you start from the user interface stored in the HP Server Remote Management Card ROM based setup options.

1. Boot the HP Server.

2. When the HP Server Remote Management Card banner appears, press F3 when prompted. You are presented with a menu of configurable options.
3. Enable the Remote Boot feature in the BIOS setup. Be sure it is "on."
4. Enter the filename of the boot image.
5. Supply the IP Address of the TFTP server. That is, identify the IP Address of the server where the remote boot image is located.
6. Reboot. During the HP Server reboot, a message indicates that the server is attempting to start from the designated boot image.

Remote Boot Option 2

The second remote boot method requires you to log onto the HP Server Remote Management Card web interface in order to set up a remote boot.

To set up a remote boot, using the HP Server Remote Management Card user interface:

1. From the HP Server Remote Management Card user interface, select the Remote Control tab.
2. Under Server Control, select one of the following HP Server start-up options:
 - ◊ Power on (if the server is off)
 - ◊ Power cycle
 - ◊ Reset

 Once you have selected an action that would bring the HP Server back online, you can further select Remote Boot features.
3. Select Remote Boot. This enables the HP Server Remote Management Card to retrieve a floppy disk image from the designated remote computer.
4. Enter the IP Address of the TFTP server and the filename of the boot image. The filename you specify should be a relative path from the root directory.
5. Press "Start Power/Reset Option" to initiate the remote boot.

As an example, if the TFTP server used *\tftp\public* as its root and the file of interest is named:

```
\tftp\public\hp\boot\ttrc\us\dos.dsk
```

you would enter the file name as:

```
hp\boot\ttrc\us\dos.dsk
```

Examples of Remote Boot Using a Floppy Boot Image

Using the HP utility copydisk.exe, you can remotely administrate numerous alternate boot routines and automate a range of diagnostic procedures for your HP Servers.

The following examples demonstrate how an administrator would set up and use floppy boot images in a typical network:

- Example 1: A remote server BIOS update
- Example 2: A remote boot of HP Diagnostic Assistant
- Example 3: A remote DOS file transfer

In these examples a remote client functions as the TFTP server (refer to Figure C-1). As you review these examples, keep in mind that for each scenario, the task could be accomplished in some other fashion. For example, the TFTP server could be located elsewhere on the intranet.

Example 1: A remote server BIOS update

In this example, the system administrator wants to update the BIOS of a remote HP Server. The administrator first obtains the latest BIOS from the HP web site and downloads it to a local hard disk. The administrator then runs the self extracting BIOS update file and copies the biosxyz.dsk file to the tftpserv base directory. The administrator then uses HP Server Remote Management Card to remote boot the biosxyz.dsk BIOS update disk.

To remotely update the server BIOS, the administrator would proceed as follows:

1. Obtain up-to-date server BIOS. Go to HP's web site (http://www.hp.com) and download the appropriate BIOS upgrade from the HP Server Service and Support page.
2. Run the biosxyz.exe self-extracting file to extract the biosxyz.dsk boot floppy image file. Copy the biosxyz.dsk file to your TFTP base directory.
3. Run tftpserv.exe. TFTP waits for a request for an image file from the HP Server Remote Management Card.
4. Run the HP Server Remote Management Card web interface. Click the Remote Control tab. Select the Reset and Remote boot options.
5. In the TFTP IP Address field, type the IP address of your client machine. In the TFTP File Name field, type:
 `biosxyz.dsk`
6. Click "Start Power/Reset Option". The server restarts and TFTP loads the image file onto the HP Server Remote Management Card where it is then

supplied to the HP Server as a boot image. The BIOS update executes automatically. Use Text Remote Control to view the progress of the update.

Example 2: A remote boot of HP DiagTools

In this example, the system administrator wants to boot to HP's DiagTools. To do so the administrator obtains a copy of the DiagTools disk from the *HP Netserver Navigator CD* Diskette Library, uses Copydisk to create a floppy image file, and uses the HP Server Remote Management Card to remote boot the DiagTools disk image.

To remotely boot DiagTools, the administrator would proceed as follows:

1. Insert the *HP Netserver Navigator CD* at the remote Windows client. The Diskette Library program will auto-start.
2. Select HP DiagTools and follow the instructions to create the floppy in drive A.
3. Using the Copydisk program, create a floppy boot image in the base directory of your TFTP server. Use the following syntax:

 `copydisk a: x:\path\diagtool.dsk`

 where *a:* is the source diskette and *x:\path* is the destination TFTP base directory on your hard drive.
4. Run tftpserv.exe. TFTP waits for a request for an image file from the HP Server Remote Management Card.
5. Run the HP Server Remote Management Card web interface. Click the Remote Control tab. Select the Reset and Remote boot options.
6. In the TFTP IP Address field, type the IP address of your client machine. In the TFTP File Name field, type: `diagtool.dsk`.
7. Click "Start Power/Reset Option". The server restarts and TFTP loads the image file onto the HP Server Remote Management Card where it is then supplied to the HP Server as a boot image. The HP Server boots DiagTools.

Example 3: A remote DOS file transfer to update a NetWare driver

In this example, the system administrator at a remote client running Windows 95 wants to reboot a remote HP Server running Novell NetWare in order to load a new SCSI device driver (the old one is believed to be faulty). To do so, the administrator obtains the latest copy of the driver from HP (AIC7870.dsk) and copies it to a formatted DOS boot disk, uses copydisk to create a floppy image file, and uses the HP Server Remote Management Card to remote boot the disk

which copies the new driver to the DOS partition. Finally, the administrator uses Text Remote Console to edit the NetWare startup.ncf file to point to the new driver.

To remotely reboot and copy the new driver:

1. Insert a 1.44MB floppy disk in drive A and create a bootable diskette. This could be at a Windows 95, 98 or 2000 client, but to ensure that the diskette has enough room for all the files, use a system with MS-DOS 6.x. At a DOS prompt, enter the command:

   ```
   format a:/s
   ```

 The /s parameter instructs DOS to include the system on the disk, making the disk bootable.

2. Obtain the new driver (in this case AIC7870.dsk). Go to HP's web site (http://www.hp.com) and download the appropriate driver from the HP's Server Service and Support page.

3. Copy the driver file to the formatted floppy in drive A. Copy the DOS editor to the floppy (in Windows 95, this file is located in: \windows\command\edit.com).

4. Create an autoexec.bat file on the floppy that includes the following command lines:

   ```
   mkdir c:\temp
   copy aic7870.dsk c:\temp
   edit c:\nw411\startup.ncf
   ```

 When finished the floppy in a: would include the following files:

   ```
   command.com
   autoexec.bat
   aic7870.dsk
   edit.com
   ```

5. Use the Copydisk program to create a floppy boot image in the base directory of the TFTP server using the following syntax:

   ```
   copydisk a:path\doscopy.dsk
   ```

 where *path* is the TFTP base directory on your hard drive.

6. Run tftpserv.exe. TFTP waits for a request for an image file from the HP Server Remote Management Card.

7. Run the HP Server Remote Management Card web interface. Click the Remote Control tab. Select the Reset and Remote boot options.

8. In the TFTP IP Address field, type the IP address of your client machine. In the TFTP File Name field, type: `doscopy.dsk`.

9. Click "Start Power/Reset Option". The server restarts and TFTP loads the image file onto the HP Server Remote Management Card where it is then supplied to the HP Server as a boot image. The HP Server boots the DOS disk and executes the autoexec.bat file. It creates a "c:\temp" directory, copies the new driver there, and brings up the NetWare startup.ncf file in the DOS editor. The administrator uses Text Remote Console to modify the path to the SCSI driver:

   ```
   LOAD c:\temp\aic7870.dsk SLOT=10001
   ```

 The administrator saves the file, exits the editor and runs server.exe to start the NetWare server.

D Technical Specifications

This appendix provides specifications for the HP Server Remote Management Card PCI card.

Feature	Description
On-Board Features	32-bit PCI Bus Master board (occupies a single slot)
	External 9-pin RS-232 connector
	External RJ45 for 10/100Base-T LAN connector
	50-pin interface connector
	8 MB Static RAM memory
	4 MB of Flash ROM memory (firmware is customer-upgradeable)
Physical Characteristics	Short PCI card
Environmental	Operating temperature: 5-35 degrees C ambient
Conditions	Non-operating temperature: -40 degrees to 65 degrees C
	Operating humidity: 20% to 80%
	Non-operating humidity: 95% non condensing
	Operating altitude: 3,046 m
	Non-operating altitude: 12,200 m
Voltage	3.3V standby
Power Consumption	10W maximum

E LED Codes

A failure on the HP Server Remote Management Card is indicated by a flashing signal pattern displayed by the red diagnostic LED visible below the RS-232 port (refer to Figure F-1). The other set of LEDs located next to the LAN port indicate LAN connection activity.

NOTE	In the event that more than one error is affecting card operation, the HP Server Remote Management Card reports only the first failure discovered.

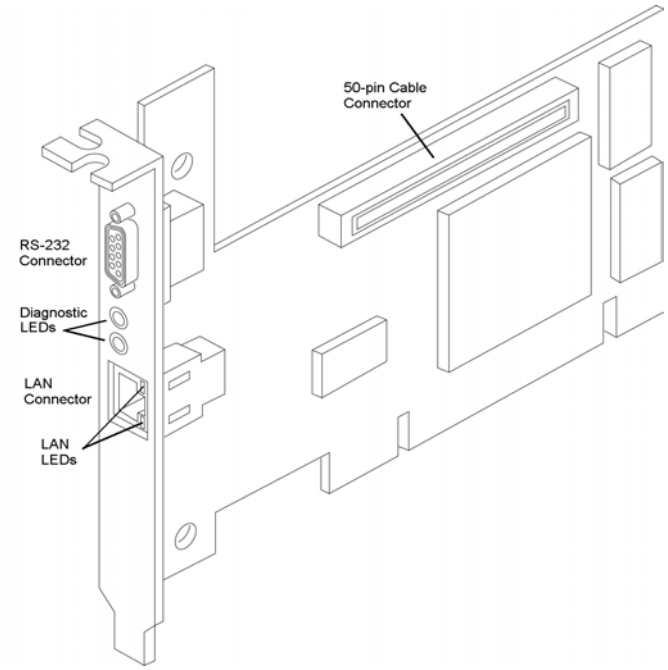


Figure F-1. The HP Server Remote Management Card LED

Each failure is stored as a four-digit code. This allows each code up to 10 "sub-codes" that can be interpreted by the diagnostic utility.

For example, a *2-1-1-2* error (DRAM Error) would appear as:
flash-flash, pause, *flash,* pause, *flash,* pause, *flash-flash,* pause

The failure pattern repeats indefinitely.

Failure Codes

The table below lists the error or report codes, which are flashed by the HP Server Remote Management Card's red diagnostic LED. A flashing red LED always indicates a problem with the card's operation.

To determine a Suggested Action, note the first three digits of the error and refer to the Report Code in the following table. The fourth digit is represented by an "X" because the number is irrelevant to the analysis.

Table F-1. Failures and Suggested Actions

Report Code (Red LED blink pattern)	Failure Reason	Suggested Action
LED on continuously	ASIC CPU Subsystem Error	See action 1
1111	FLASH-ROM Error	See action 2
211X	DRAM Error	See action 3
311X	LAN Interface Error	See action 1
411X	RS-232 Interface Error	See action 1
511X	PCI Interface Error	See action 1
611X	ICMB Error	See action 1

The "X" in the report code represents a possible number between 1 and 9 and is not significant.

Suggested Actions

The following remedies refer to the Suggested Actions listed in the last column of Table F-1 above.

Action 1: First verify the fault. Cycle power at the server to restart the HP Server Remote Management Card. If the same error is reported again, call your local support center.

Action 2: The card firmware may be corrupted and require updating. You may either use the firmware image that came with the card on the *HP Netserver Navigator CD*, or you may download the latest firmware update image from the HP Server BBS or web site (see Technical Support in

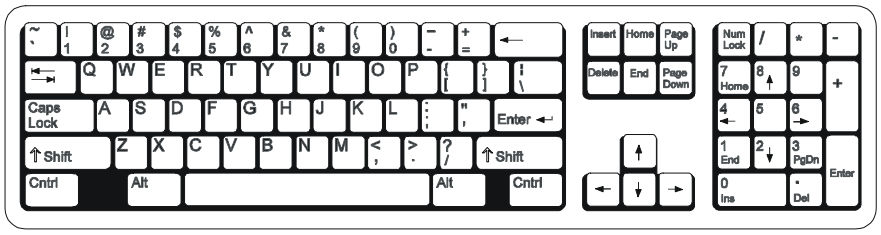
Appendix H). This image should be copied to your TFTP server (to use the TFTP software, refer to Appendix C). If you are unable to complete this procedure, call your local support center.

Action 3: Call your support center. If you need to call your local support center, make sure that you have the HP Server Remote Management Card product information on hand including serial and version number. Also be sure to note the relevant LED code and description.

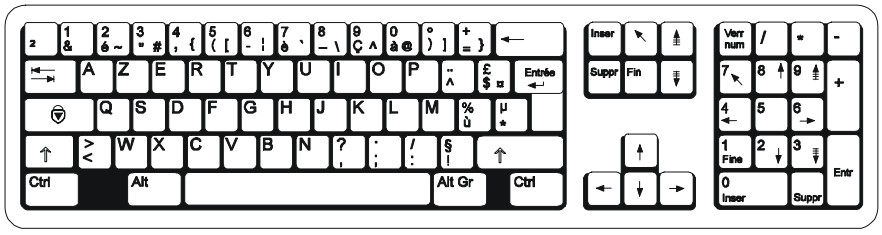
F Keyboard Layouts

The HP Server Remote Management Card allows an administrator to select a keyboard layout that matches the server keyboard. With the proper keyboard layout, the HP Server Remote Management Card is able to correctly interpret keystrokes sent to the server keyboard. The HP Server Remote Management Card includes support for France, Italy, Germany, Spain, United Kingdom, and United States keyboards.

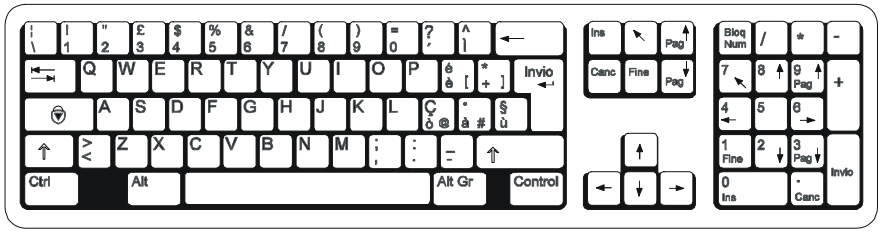
The graphics below provide layouts for each of the keyboards supported by the HP Server Remote Management Card. If you are using an unsupported keyboard, you can map keystrokes by pressing the key on your keyboard that corresponds to the location of the key on the configured keyboard layout.



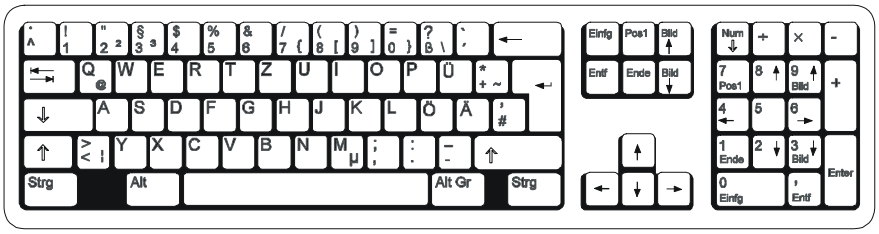
United States



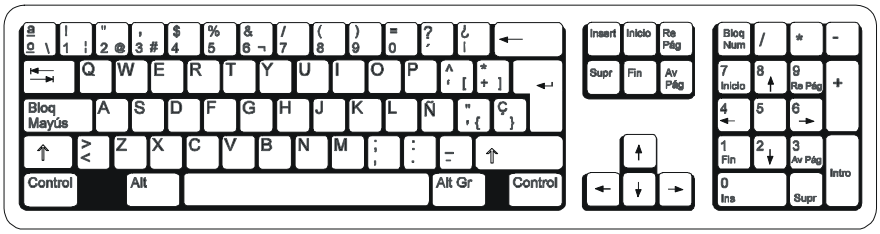
France



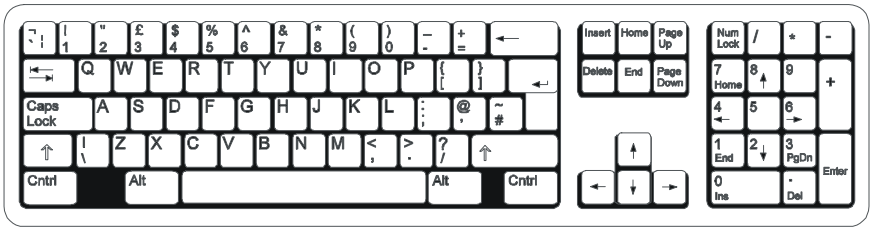
Italy



Germany



Spain



United Kingdom

G Group Actions with HP Toptools

Integration with HP Toptools Device Manager

The HP Server Remote Management Card fully integrates with the Toptools Device Manager product (version 5.0 and above). Access to your HP Server Remote Management Card may be done via accessing a server page of a server that has the HP Server Remote Management Card installed, or through the Others list under Devices|Device Types.

Group actions: If you use the HP Server Remote Management Card in a server managed by HP Toptools Device Manager, you can perform "group actions" on multiple HP Server Remote Management Cards by selecting all the cards you want with your mouse and right-clicking. Group actions include adding and deleting users, changing user passwords, viewing user configurations, replicating card configurations, powering on and off the server, and updating card firmware.

Selecting the Correct Remote Management Cards

In HP Toptools, the "Device type" for the HP Server Remote Management Card is "Management device, remote control card."

CAUTION	The HP Server Remote Management Cards used in the tc3100and tc4100 HP Servers are not the same as the Remote Management Cards used in other HP Servers.

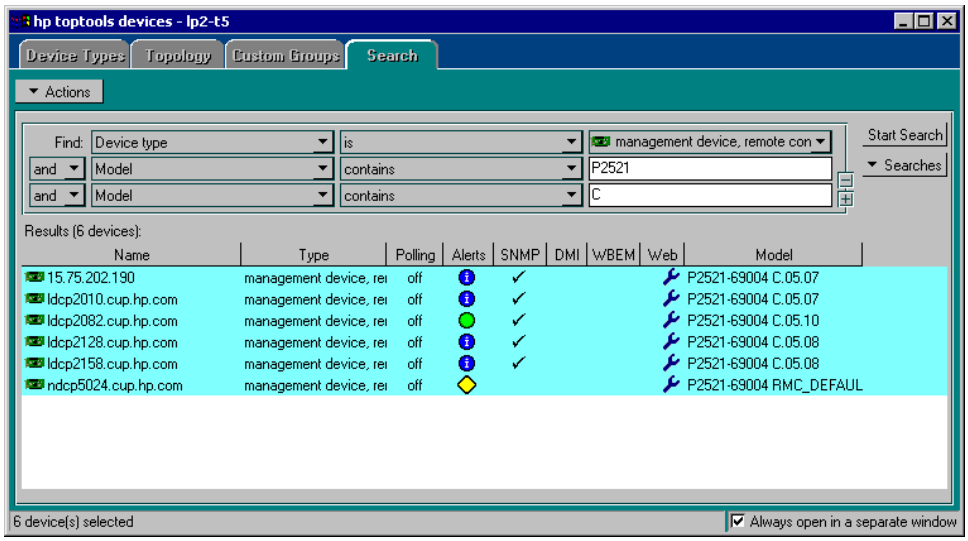
HP Toptools does not distinguish between the different types of Remote Management Cards. To select a group of the cards for tc3100 and tc4100 Servers, you must search for Remote Management Cards with the correct model number (P2521) and firmware prefix (C) using this procedure:

1. Launch HP Toptools.
2. Open the Devices drop down list by clicking the Devices button on the menu at the left of the Toptools screen.
3. Choose Search from the Devices drop down list.
4. Enter the search criteria shown in Figure G-1, and click Start Search.



Figure G-1. Search Criteria for tc3100, tc4100 Remote Management Cards.

The search will select the tc3100 and tc4100 Remote Management Cards, as shown in Figure G-2:



NOTE The data in the Model column include both the Management Card's model number and its firmware number. If you believe that your search is not finding the correct Remote Management Cards, verify that you are searching on the correct model and firmware numbers.

CAUTION	HP Toptools will not find tc3100 and tc4100 Remote Management Cards that have recently been added until Toptools "discovery" has been run. This is a lengthy procedure that is usually run at night. Check with your network administrator if you are unsure. After discovery has occurred, you can add the new Remote Management Cards to your custom group.

Making a Custom Group

You can perform group actions directly on the Remote Management Cards found in your search (Figure G-2). You can also create a "custom group" of these cards that you can easily retrieve at a later date. To make a custom group:

1. Select all the Remote Management Cards found in your search.
2. Right-click anywhere in the selected bloc to open a floating menu.
3. Select Add to Custom Group from the menu.
4. Either add the Remote Management Cards to an existing group, or create a new group.

Accessing Custom Groups

To open a custom group that you have previously created, click the Devices button on the menu at the left of the Toptools screen, and choose Custom Groups from the Devices drop down list.

H Software License, Warranty, Regulatory and Support

Hardware Product Limited Warranty

Hewlett-Packard Hardware Accessories

HP warrants this HP Server Hardware Accessory against defects in material and workmanship under normal use, for a period of one year. The warranty commences on receipt of this product by Customer from HP or Reseller. If HP or Reseller receives notice of such defects during the warranty period, HP or Reseller will either, at its option, repair or replace products that prove to be defective.

An HP Server Hardware Accessory is an HP hardware product, specifically designated for use with Servers, that is added on or integrated into an Server in order to provide higher performance, capacity, or increased capability; and is listed as a product in HP's Corporate Price List. Upon installation inside a Server, the Server Hardware Accessory carries a one-year Return-to-HP warranty or the remainder of the warranty period for the original Server in which it is installed, whichever is longer.

Should HP or Reseller be unable to repair or replace the hardware accessory within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the hardware accessory product.

Software Product Limited Warranty

Ninety-Day Limited Software Warranty

HP warrants for a period of ninety (90) days from the date of the purchase that the software product will execute its programming instructions when all files are properly installed. HP does not warrant that the operation of the software will be uninterrupted or error free. In the event that this software product fails to execute its programming instructions during the warranty period, Customer's remedy shall be a refund or repair. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and all copies.

Removable Media

HP warrants the removable media, if supplied, upon which this product is recorded to be free from defects in materials and workmanship under normal use

for a period of ninety (90) days from the date of purchase. In the event the media prove to be defective during the warranty period, Customer's remedy shall be to return the media to HP for replacement. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and destruction of all other non-removable media copies of the software product.

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- The **Server software** (which includes utilities, and Symantec's pcAnywhere product supplied by HP) may be used on one HP Server system that includes the HP Server Remote Management Card. Additional licenses for pcAnywhere must be purchased from Symantec in order to install it on other HP Server systems.
- The **Remote Client communications software** (Symantec's pcAnywhere product supplied by HP) may be used on one remote personal computer workstation. Additional licenses for pcAnywhere must be purchased from Symantec in order to install it on other personal computer workstations.

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Notice for USA

FCC Radio Frequency Emissions Statements

For Products Labeled "Class B"

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/television technician for help.

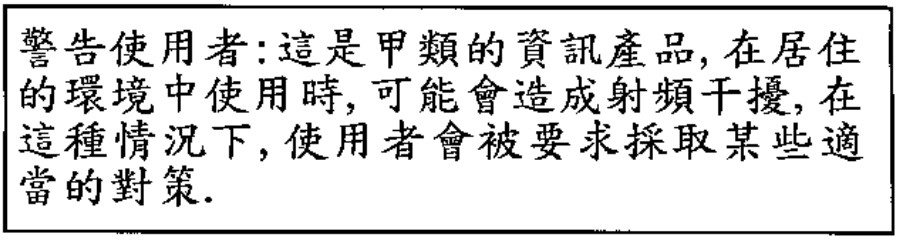
Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your server. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment. Cables used with this device must be properly shielded to comply with the requirements of the FCC.

For Products Labeled "Class A" LAN Connection

This equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at their own expense.

Notice for Taiwan

Class A Warning



DECLARATION OF CONFORMITY (US and EU)

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 10955 Tantau Avenue
Cupertino, California, 95014 , USA

declares, that the product

Product Name: The HP Server Remote Management Card
Model Number: P5445A
Product Options: All

conforms to the following Product Specifications:

Safety: IEC 60950:1991+A1+A2+A3+A4 /
EN 60950:1992+A1+A2+A3+A4+A11

EMC: CISPR 22:1997 / EN 55022:1998
CISPR 24:1997 / EN 55024:1998
IEC 61000-3-2:1995 / EN 61000-3-2:1995 +A14
IEC 61000-3-3:1994 / EN 61000-3-3:1995

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE-marking accordingly.

Date: January 15, 2002 Product Regulations Manager

European contact for regulatory topics only:
Hewlett-Packard GmbH, HQ-TRE, Herrenberger Strasse 130, D-71034 Böblingen (FAX: +49-7031-14-3143)

North American Contact:
Hewlett-Packard Company Product Regulations Manager, 3000 Hanover Street, Palo Alto, California, 94304
(Ph. # 650-857-1501)

Technical Support

During the warranty period, telephone technical support is available to assist with setup, configuration, startup, and troubleshooting of your hardware product.

Prior to calling HP or Reseller, please follow this checklist. This will allow HP or Reseller to assist you more quickly and efficiently.

1. Consult the documentation provided with your product to assure that your system features are properly configured.
2. Execute the diagnostics provided and record the information. Consult the accompanying documentation for instructions.
3. Record the following information:
 - ◊ Product model name and number
 - ◊ Product serial number
 - ◊ Applicable error messages from system or diagnostics
 - ◊ Applicable hardware driver revision levels
 - ◊ Add-on cards or hardware
 - ◊ Third-party hardware or software
 - ◊ Operating system type and revision level

 Most of this information can be obtained by using HP Toptools.

U.S. and Canada

For hardware service and telephone support, contact either:

- A participating Reseller
 or
- HP Customer Support Center (Colorado): 970-635-1000

Europe

For hardware service and telephone support, contact either:

- A participating Reseller
 or

- HP Customer Support Center (Netherlands):

Austria:	0660 6386	Netherlands:	020 6068751
Belgium (Dutch):	02 626 8806	Norway:	22 11 6299
Belgium (French):	02 626 8807	Portugal:	01 441 7199
Denmark:	3929 4099	Spain:	902 321 123
Finland:	02 03 47 288	Sweden:	08 619 2170
France:	01 43 62 3434	Switzerland:	084 880 1111
Germany:	0180 525 8143	United Kingdom:	0171 512 5202
Ireland:	01 662 5525	International (English):	44 171 512 5202
Italy:	02 2 641 0350		

Other Countries

For hardware service, contact your local Reseller or HP sales office. For telephone support, contact your Reseller.

Other Information

HP web site at:
http://www.hp.com

I Installing the Visual Diagnostic Panel

The Visual Diagnostic Panel

The Visual Diagnostic Panel for your tc3100 or tc4100 HP Server provides a set of LEDS that are used for troubleshooting. It is a small, self-contained circuit board in a black plastic housing that snaps into a receptacle in the Server chassis. A label affixed to the housing identifies the LEDs, as shown in Figure I-1.

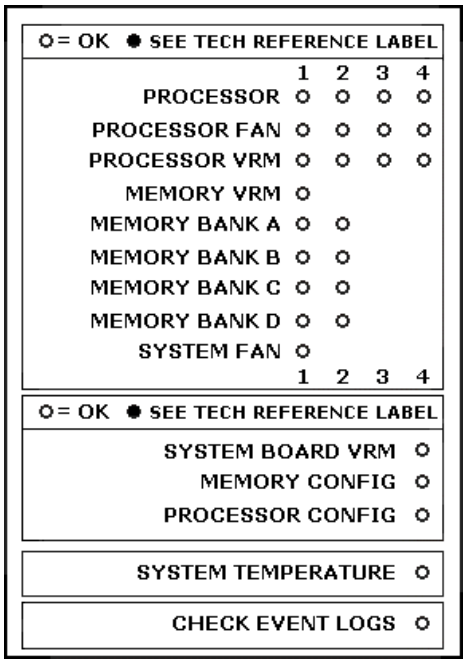


Figure I-1. The Visual Diagnostic Panel LEDs

Use of the Visual Diagnostic Panel as an aid in troubleshooting the Server is described in the Server manual.

NOTE	The Visual Diagnostic Panel depends on information collected by the HP Server Remote Management Card and will work only if the Remote Management Card is installed. This is the reason for shipping the Visual Diagnostic Panel together with the HP Server Remote Management Card.

Installing the Diagnostic Panel in the tc3100 HP Server

Installing the Diagnostic Panel

1. Power down the HP Server.
2. Disconnect the power cord(s).

WARNING	The power supplies continue to provide standby voltage to the HP Server until the power cord(s) is/are disconnected.

3. Remove the cover.
4. Snap the Diagnostic Panel into place, as shown in Figure I-2.

NOTE	Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

Connecting the Cable

The Visual Diagnostic Panel for the tc3100 HP Server is shipped with a cable that has a small connector at one end and a large connector at the other end. Plug the small cable connector into the Diagnostic Panel after it has been snapped into place and then plug the large cable connector into the Server's motherboard, as shown in the figure.

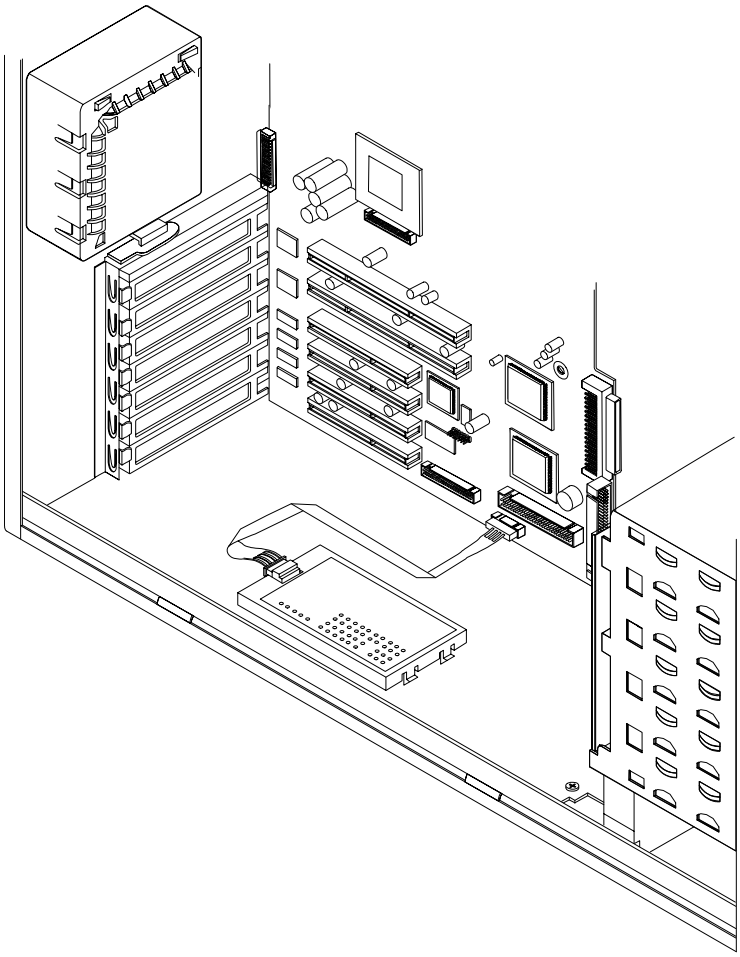


Figure I-2. Installing and Cabling the Diagnostic Panel in the tc3100 Server

Installing the Diagnostic Panel in the tc4100 HP Server

Installing the Diagnostic Panel

1. Power down the HP Server.
2. Disconnect the power cord(s).

WARNING	The power supplies continue to provide standby voltage to the HP Server until the power cord(s) is/are disconnected.

3. Remove the cover.
4. Snap the Diagnostic Panel into place, as shown in Figure I-3.

NOTE	Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

Connecting the Cable

The tc4100 HP Server is shipped from the factory with a short cable that is connected on one end to the front panel. The other end is free, waiting to be connected to the Visual Diagnostic Panel after it is snapped into place, as shown in the figure.

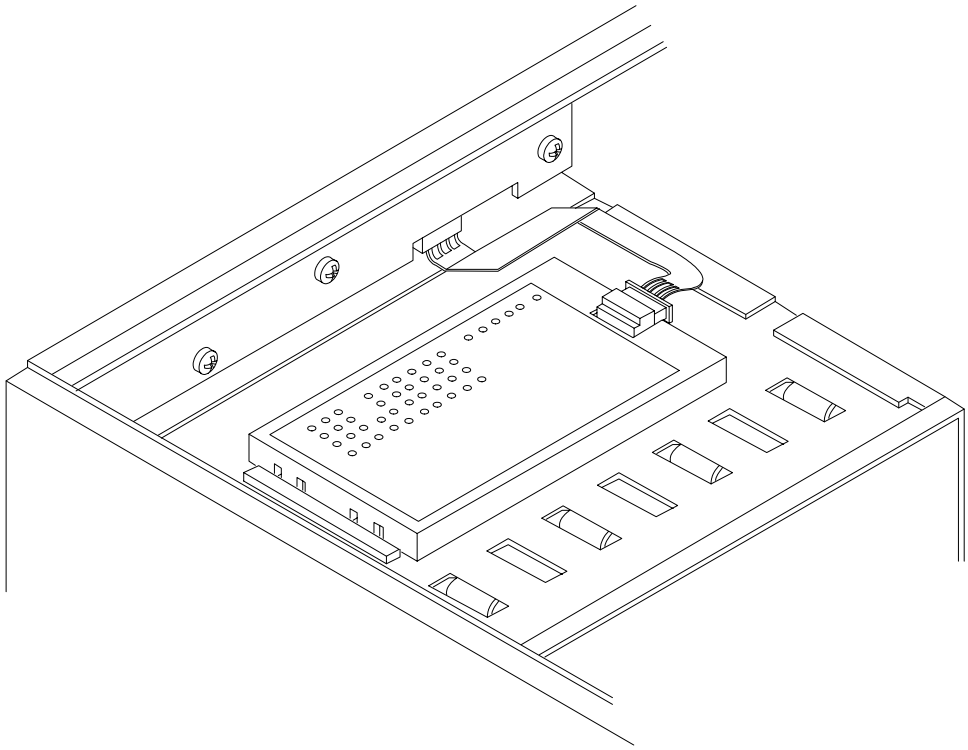


Figure I-3. Installing and Cabling the Diagnostic Panel in the tc4100 Server

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